

The University of Chicago

THE
CLASSIFICATION OF BOOKS

An Inquiry into its Usefulness to the Reader

A DISSERTATION SUBMITTED TO THE
FACULTY OF THE GRADUATE LIBRARY
SCHOOL IN CANDIDACY FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY

1934

BY
GRACE OSGOOD KELLEY

NEW YORK
THE H. W. WILSON COMPANY

1937

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PREFACE

CONDITIONS within the field of librarianship, though changing gradually along with those within the spheres of other social institutions, are still under the spell of tradition. The thoughtful observer will find, however, that librarians are more and more convinced of the need for a wise readjustment in their thinking and in their present programs of activity. It is becoming clear to them that the service of libraries must be adjusted to a widening horizon of thought, to a broader area of usefulness, and to a world that is a going and changing concern. Above all, their object is to discover in what way and to what extent this service can contribute increasingly intelligent direction to future social and educational progress.

Toward this end librarians are becoming more and more active in opening up the resources of their libraries and in devising ways to bring the right books to those readers who can make the best possible use of them. Collections of books in libraries can be thought of as partial, or even, in some few cases, as almost complete representations in print of the world's knowledge. But it is evident that this knowledge, if stored in books which are not used, is dead. On the other hand, if the subject-matter can be brought into contact with living and productive minds, it becomes alive and in this way new ideas and knowledge tend to be created. In helping to make possible this vital contact the library assumes an important educational function.

In what ways, then, are books and readers brought together? For our present purpose, we shall stress, out of various ways, but two such forms of library procedure, namely, the classification of books and, to a lesser extent, subject-cataloging. One may think of these two processes, singly or together, as the Great American Library Dream—that dream of librarians which strives

to reveal to readers the subject-contents in books. For the well-known and aspiring aim of both is to interpret and record the subject-matter in books in such a way as to make it easily and almost automatically available for use by the patrons of the library.

It should, however, be perfectly clear that effective results of this kind are not easily and automatically attained. Such ends can be achieved by librarians only when work along these lines is based upon a wide, accurate, historical, and interrelated knowledge of the subject-matter in books, upon an intelligent understanding of the specific needs of the various readers, and upon a library technique through which decisions can be accurately expressed and which can be developed and improved as need arises.

Up to the present time these conditions have been met but partially by librarians. Thus the Dream remains a dream, its fulfillment possible only through a complete understanding of the nature and importance of the problems involved.

A rich field is now available for an objective examination of the results of classification and subject-cataloging. Great numbers of books stand classified on the shelves of great numbers of libraries as the static evidence of the effort made by the librarians of our generation to apply present systems of classification to collections of books. Year by year these arrangements as such are becoming more extensive, more complex and chaotic, and increasingly difficult to use. Also, dictionary catalogs of vast dimensions contain our further efforts to express and transmit to the readers a conception of the subject-matter contained in the books.

We are offering these arrangements of books and these card-records of subjects to the public to be used. But do they achieve their purpose and are they endorsed by those for whom they are made? What will be the judgment passed upon our work by serious users of the library and by future generations of readers and librarians? That something is yet to be desired by those

who would be expected to depend upon these library methods is evident from the questions which have been voiced by thoughtful readers of the library:

"Why do the methods of classification and subject-cataloging bring to light such a small proportion of a library's material on a definite subject?"

"Why is it that the books on a subject in which one is interested are scattered in so many places on the shelves? Under the number indicated for a definite subject we usually find but a small proportion of the material we are seeking. The subject-catalog may yield more titles on the same subject, but even there the record appears to us far from complete."

Any attempt to answer such questions as these would call for an explanation of how classification works; that is to say, what can be expected of it in actual results, in terms of use, in view of the great variety of factors, inherent and imposed, which affect its method of operation and application.

The theme of such a study has been in the writer's mind for a number of years, and only gradually has it assumed definite form. The inquiry was undertaken first with the object of analyzing certain technical processes commonly used in libraries. Later, though retaining suggestions for change and improvement of library service of interest to librarians, the form of presentation was modified with a view to explaining to the library reader the nature of the use of books made possible through the present techniques of classification and subject-cataloging.

In other words, emphasis has been placed, not so much upon a description of these processes as such, as upon an effort to carry over their significance, as expressed in concrete terms of service rendered, to the reader who uses the books on the shelves but who has little or no understanding of the principles which govern their arrangement. The point of view of the latter has been held constantly in mind.

Our object thus has been twofold: to present to the library reader reasons for the insufficiencies and frustrations met with

in using arrangements of books and card-records; and to offer, at the same time, practical suggestions to librarian and reader for lessening, in some measure, these same fundamental weaknesses.

Thus the results of detailed, systematic classification for libraries, apart from any single scheme, are dealt with primarily. Yet, nevertheless, the adoption of the Dewey Decimal Classification, and, to a lesser extent, of the Library of Congress system, has been so widespread in the libraries of America that in many circles the term classification is synonymous with these systems. This being true, in discussing classification in general, the individual schemes enter in.

The writer wishes to take this opportunity to express respect and admiration for the way in which the able editors of the Decimal Classification have carried on the difficult work of expanding the tables of that system. The increasing difficulties connected with continued and detailed expansions together with the almost insuperable obstacles standing in the way of their application to growing collections of books may justify, in some measure, the present inquiry whose aim is to suggest ways of simplifying the problems of classification in the light of the practical usefulness of resulting arrangements of books.

Following an introduction in which the reader's point of view is developed, we consider the recent historical situation with respect to classification. The need for availability of subject-matter is brought out in Chapter III, and also the way in which librarians have met this need. Thirteen elements which affect adversely the usefulness of classified arrangements of books are described in Chapter IV, followed in Chapters V and VI by two studies analyzing certain of these elements. A brief conclusion in Chapter VII is followed, in Chapter VIII, by a rather extensive but selective Bibliography. The Appendix is devoted to a statement of certain problems which are considered suitable for further study in the fields of classification and subject-cataloging.

English and foreign literature on classification is voluminous, only a minor portion of it, however, being devoted to discussions on the organization of knowledge in relation to the classification of books. Literature on subject-cataloging is so far meager and remains to be written. The present Bibliography makes no pretence of being exhaustive. Titles have been chosen whose contents contribute something, even though slight, to some phase of the present discussion upon the use of classified books and subject-catalogs.

In making the acknowledgments customary on such occasions as this, it is a pleasure to recall and to express gratitude for advice received from the members of the faculty of the Graduate Library School of the University of Chicago. My thanks go also to Charles Martel, of the Library of Congress, who read and criticized the manuscript in its early form; to Henry E. Bliss, of the College of the City of New York, whose opinions, though sometimes differing from my own, have been helpful and stimulating; and to Professor Truman L. Kelley, of Harvard University, for criticism, encouragement, and sustained interest in my theme.

GRACE O. KELLEY

May 20, 1937

CONTENTS

	PAGE
PREFACE	5
CONTENTS	11
LIST OF TABLES	13
CHAPTER	
I. The Reader's Point of View.....	15
II. The Classification of Books in America With Some Historical Background.....	23
III. The Subject-Approach to Books: The Need for Availability of Subject-Matter.....	47
IV. Thirteen Elements Which Affect the Usefulness of Classification	66
V. Investigation Number One: How Systematic Clas- sification Works	83
VI. Investigation Number Two: Distribution of Titles Under Specific Subjects in the Dictionary Catalog..	100
VII. Conclusion	126
BIBLIOGRAPHY	
Books	131
Articles	137

APPENDIX: Classification of Books and Subject-Cataloging as Fields for Investigation

Introductory Survey	153
---------------------------	-----

Problems

Group

I. Classification and Subject-Cataloging in General	155
II. Subject-Cataloging	159
III. Work of Classification	163
IV. Studies in Building Systems of Classification ..	165
V. The Decimal and the Brussels Classification ..	169
VI. The Library of Congress System of Classification	171
VII. The Dictionary Catalog: The Arrangement and Use of the Sections Devoted to Subjects ..	173
VIII. The Classified Catalog and Shelf-List	177
IX. Administrative Problems, Including Cost of Cataloging and Classification	179
X. Reference Work in Relation to Classification and Subject-Cataloging	181
XI. Special Libraries	183
XII. Proposed Training for Librarians in Fields of Subject-Matter	185
XIII. Techniques Needed for the Integration of the Subject-Matter in Books With the Practical Requirements of Library Service	187

INDEX	189
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LIST OF TABLES

I.	Positions of Beaver, Buffalo, and Cormorant in the Two Classification Systems in Relation to Superordinate Groups From Which They Have Been Separated and Which May Contain Material on These Subjects	84
II.	Steps Under Which Material on Subject is Traced.	87
III.	Total Pages of Material on Beaver Traced in University of Chicago Library	88
IV.	Distribution of Material on Beaver Shown in Percentages	91
V.	Total Pages of Material on Buffalo Traced in University of Chicago Library	92
VI.	Distribution of Material on American Buffalo Shown in Percentages	94
VII.	190 References on Cormorant Divided into Six Divisions	95
VIII.	Pages of Material on Cormorant Found Under Specific Class-number, in Dictionary Catalog, and Under the Six Divisions	96
IX.	Distribution of Material on Cormorant Shown in Percentages	97
X.	Frequency of Citation of Subjects in Dictionary Catalog of University of Chicago Library.....	112
XI.	Frequency of Citation of Subjects in Dictionary Catalog of Library of Congress	115
XII.	Frequency of Citation of Subjects in Dictionary Catalog of Massachusetts State Library	118
XIII.	Frequency of Citation of Subjects in Dictionary Catalog of Northwestern University Library....	120
XIV.	Comparison of Results of Tables X-XIII.	123

CHAPTER I

THE READER'S POINT OF VIEW

CERTAIN discussions on the classification of books remind one of a type of exegetical discussion of scriptural writings, where the burden of emphasis is placed upon explanations and interpretations of an accomplished fact, as it were. The subject of classification has seemed to be a closed one in most library circles so far as lively and helpful discussion is concerned. Certain tools for putting it into operation have been at hand for many years, with the result that books stand classified in vast numbers on the shelves of libraries. Little effort, however, has ever been made to go back of these arrangements to trace the underlying reasons for their existence, or to go forward to examine the nature of the use that can be made of books due to their being classified.

In the case of the exegesis of the scriptures the inspired nature of the text can be said to furnish reason for this unscientific kind of approach. The classification of books in libraries, however, does not claim to be of sacrosanct origin. It is mainly utilitarian in nature being carried on by one group of persons for the purpose of aiding others in the subject-approach to books. Its meaning and value, obviously, cannot be determined by *a priori* assumptions as to worth but can actually be arrived at only in terms of its resulting usefulness for those who use the books so classified. Yet, strangely enough, *its* point of departure in discussion has far too often been a fixed one also, as though its reason for being and continuing in its present form and with its present results had been settled once and for all.

This finality of opinion seems to be based in part upon the major general assumption by librarians that a systematic classification of books in accordance with some detailed, more or

less arbitrary organization of subject-matter will yield far greater, more dependable and permanent help for all readers who consult the books so arranged on the shelves, than any other kind of classification. The logical corollary to this has seemed to be that, as collections of books increase in size, more and more detailed subdivision of subject-matter is called for.

It is probably safe to assert that librarians base their conclusions regarding the usefulness of a generally uniform systematic classification upon the assumption that one common order of subjects will be definitely and approximately of equal help to the various types of intelligent readers who consult the shelves. Obviously, then, the order of subject-matter which librarians adopt for the arrangement of books is that order which to be of help must come most naturally into the mind of any fairly competent reader who seeks to use the books so arranged. Do we not visualize him as having gone to the shelves in search of books on a particular subject, and becoming aware at once of the order before him? It is then supposed that he will find to the right and to the left books which in his own mind are most nearly related to the primary subject of interest.

It has been said in library text-books that one subject merges into another and that through this arrangement related topics bearing on a main class will be brought into relief, and the user is led from one subject to the next most closely related. This assumes that there is a discoverable order which brings books into relation on the shelves with other topics in such a way that any user is led from one topic to the next most closely related to it. The awareness by each reader of the order before him is thus taken for granted. Otherwise, if the order had no meaning for him, obviously it would be of negligible aid. In some magic way which no one has thus far explained, the order preferred by the librarian and that of each reader are assumed to be one and the same thing and all is well.

Though a system of classification be used which is so excellent that some of the users are led by it from one subject to

another "most closely related," still there is evidence to show that the importance of this relationship is so small in comparison with the multitudinous relationships operating in the minds of the readers that only a small minority could thus be served. The awareness by the great majority of readers of the nature of the detailed, systematic order of books before them does not exist.

Due to many distinct factors, to be enumerated later, which affect the application of any system of classification to books, the reader, with the shelves of books spread out before him, is usually but dimly conscious that there is any effort at all at a subdivided logical organization of the subjects facing him. He may detect in an impressionistic sort of way the larger divisions of subject-matter, but the nature of the specific order eludes him. He neither makes nor does he seek sense in the arrangement. He glances at random, or sometimes carefully, over a rather wide section of the shelves. He feels a sense of satisfaction if he finds here and there certain books he needs. On the other hand, he feels a sense of disappointment and frustration when other related or similar books, needed by him as much or more, are missing. He does not in the least understand why these are missing and blames, in general, the whole library system. The college professor, with a clearer pattern of the field he is studying than is usually in the mind of the average reader, has spoken, in no uncertain terms, of the arrangements of books he has found: "A system of cataloging that separates . . . literature that should be massed together, sets of single purpose and material of the same character, is more than an annoyance—it is an actual hindrance."¹

Considerable evidence in support of such conditions as these comes from the long experience of the writer in the work of classification, followed by academic study which has made it possible to test out the actual use that can be made of classified

¹G. S. Ford. "The Library and the Graduate School," *Journal Association of American Universities* (1913), p. 38.

books. Many years spent in public, scientific, and university libraries in classifying books under a detailed system of classification were followed by several years of study in psychology and in sociology and related fields, which called for an extensive use of these books on the shelves.

It was early realized that direct consultation of the books under class-numbers which were meant to cover the specific fields of interest furnished only a starting-point in revealing the resources of the library on a subject. Continually the same disappointment and frustration which other library readers have felt were present when important and needed books seemed to be missing or misplaced.

Further experience as Readers' Consultant in a large public library system added fuel to the flame. In seeking to assemble books on like subjects according to the way they had been asked for by readers and according to the *use* that was to be made of them, it has almost always been found necessary to gather them from many places in the classification system. In other words, the grouping of the several aspects of a subject and of auxiliary subjects about the inquirer's central field of interest differed from that defined by the system or by the system's interpretation by the classifier.

Thus, books bearing upon the various aspects of such topics as Adult education, Self education, Group discussion, Community organization, Psychology and daily life, Career books, Vocational guidance, the Youth movement, Religion and life, Social welfare, Leadership, Mental hygiene, Character-building, Parent education, and a host of other timely and eagerly sought-for subjects have each had to be sought under many different class-numbers on the shelves. In other words, it has been found, again and again, that the criterion of use has not appeared to be the primary principle governing the placement of books. The writer knows only too well that classifiers do constantly strive to place a book where they think it will be used. Their failure to achieve this purpose consistently and more frequently than

they do seems to be due in part, at least, to the fact that, unversed in many of the fields handled, they cannot always determine what its actual, major use will be. Many other factors, as well, limit the placing of books.

The uniqueness of the writer's position has lain in this, that, due to this long and intensive previous library experience in the classification of books, and also as a user of books which had been classified, she has been able to view the problem from both approaches, that of the one who determines the placement of a book and that of the one who uses the book so placed. She has thus been able to surmise reasons for many discrepancies and omissions. These were seen to be of two kinds: those which, clearly, were inherent in systematic classification itself and which were therefore, for practical purposes, beyond the control of the librarian; and those which, due to the various conditions under which classification is applied to books, might be controlled to a considerable extent by an improvement of service. These inherent and imposed factors which bear upon the usefulness of classification are enumerated and developed in Chapter IV.

Our examination into the nature of the use that can be made of books due to their being classified has been based upon what has been termed close or specific classification. This term, never clearly defined, has for many years been used in general contrast to broad classification. Over fifty years ago it was captiously suggested that close classification would logically call for a separate place for every variety of animal; more recently, librarians have described it as the most minute analysis of a subject where subjects are arranged in very small subdivisions as under a class or division. One writer uses the term broad to imply breadth and inclusiveness in the range of the divisions of subjects on the shelves, as properly applied to abstract subjects and indefinite literary subjects; while the term close signifies in general the appearance of distinct and concrete

subdivisions of subject-matter called for in scientific and historical subjects.²

It is evident that we are dealing, in this matter of classification of books, with the whole range of knowledge, where subject-matter differs in nature so that its divisions cannot be subjected to identical steps or even to identical methods of subdivision. For our present purposes, it would, therefore, seem advisable to seek a working description, in terms of results, of the degree of specific subdivision which may be considered practical, rather than to attempt to state a definition which might assume its uniform application to all subject-matter.

Certainly, subdivision more specific than the major classes and divisions of knowledge is to be desired in all fields, but the degree and kind of analysis would depend upon the nature of the field. In general, where minute subdivision would result in gathering under one class-number but a very small proportion of the library's total material on a definite subject, we suggest that there is reason to cease dividing before such a point is reached and to seek other ways for indicating the further divisions of the subject.

In general, then, specific classification can be considered practical which tends to group together a fair proportion of the library's titles on a subject. But classification which subdivides the material so minutely that it tends to group together a very small percentage on a specific subject is too detailed and therefore not practical.

This does not mean, however, that concrete indication of such specific subjects is undesirable or impossible; their indication is very important but may well be left to a form of library record which is far more flexible than the arrangement of books, namely, to the alphabetical subject card-catalog, where the chances are greater that a larger proportion of titles on the subjects in question will be grouped together. The function of

² Cf. H. E. Bliss, *The Organization of Knowledge in Libraries* (New York, H. W. Wilson, 1933), p. 11.

the subject-catalog and its relation to classification will become clear as the present study progresses.

In examining the general assumption regarding the need for minute classification for large and growing collections of books, we shall take it for granted that a growing library will show fairly uniform accretions in all of its active fields and in all types of printed material; hence, the results, reached in our investigations, which are shown in terms of percentages and which are true for a large library at one period, will remain true as it increases its holdings uniformly. In other words, the results of detailed classification will be shown, not in relation to size of library, but to type of subject-matter.

In general, we have attempted to throw light upon such questions as the following:

In pragmatic terms, does the classification of books work? Do the results that are expected to be obtained in a given situation follow from it? Does it succeed in grouping together on the shelves the library's major resources on a definite subject?

In what way and to what extent is the library patron helped by classification of books on the shelves? In other words, what is the nature of the use of books that is made possible due to their falling under closely subdivided arrangements on the shelves?

Is it kept in mind by librarian and reader that the ultimate value of classification, when used with an alphabetical, rather than with a classified, subject card-catalog, resides mainly in the usefulness of the arrangement of books on the shelves? And that the shelf-list, being a replica of the order of books, duplicates the characteristics of this order, except in so far as it serves to bring together books or groups of books which have been taken or forced out of their classified order?

Are the arrangements of books which librarians offer endorsed by those who use the books?

To what extent does the alphabetical subject-catalog supplement the classified order of books?

It is clear that, whatever our assumptions and ideals may be regarding classification of books, their validity can be tested only by putting this process into action, deriving results which are concrete and measurable, and then comparing these with the original assumptions. Such a problem calls for an examination of the fundamental nature of the classification of books; of the various factors which affect its method of operation; and finally, a testing-out of the actual use that can be made of books due to their being classified. This, in small part, we have attempted to do in subsequent chapters.

CHAPTER II

THE CLASSIFICATION OF BOOKS IN AMERICA WITH SOME HISTORICAL BACKGROUND

AMERICAN literature on librarianship, dating from 1876 and extending to the beginning of the twentieth century, is fairly rich in the discussion of the classification of books by subject-matter.¹ Dr. Louis R. Wilson states that librarians meeting in Philadelphia in the year of the Exposition were conscious of four major needs, one of which was a basic system of classification.²

The content of this early discussion was of course the product of the period, since in all thinking and discussion, the background of the contemporary situation is implicit, even though it does not form a part of the actual subject under discussion.³ With respect to the classification of books for libraries this means that for more than a score of years, between 1876 and 1900, argument was free and vigorous. Since for more than half that time it was untrammelled by particular adherence to any one system, it dealt earnestly with the advantages and disadvantages of detailed classification in general. That the disputants lacked the years of experience in classifying books that would tend to make their arguments wholly reliable did not destroy the value of these debates.

Thus it has happened frequently that truly valuable discussions on the worth of established practices have taken place dur-

¹ U. S. Bureau of Education, *Public Libraries in the U. S. of America; Their History, Condition and Management*. Washington. 1876. In this volume, forty pages were devoted to classification. Mr. Martel stated in 1911 that this report "retains all of its interest and much of its authority."

² L. R. Wilson, "Aspects of Education for Librarianship in America." *Library Quarterly*, II (1932), 1.

³ Cf. John Dewey, "Context and Thought," *University of California Publications in Philosophy*, XII (1931), 203-24.

ing the period preceding their actual initiation and general adoption; that is, before one method or set of principles has won out against others, and while the debates yet deal with the theoretical as well as with the actual strength and weaknesses of the proposals. Once these are adopted and put into practice, argument and discussion on the part of many tend to die away. During such a period in the history of classification, numerous systems for the arrangement of books existed in libraries but no one system held the field. All of these were more or less unsatisfactory and librarians were generally agreed that something had to be done.

The finest minds in the library profession participated in the early discussions in America regarding the merits and drawbacks of detailed classification of books. Charles A. Cutter stressed the criterion of convenience when he stated clearly:

The practice of division by distinct subjects is advocated on the ground that it is convenient, which it certainly is up to a certain point. If beyond that point it ceases to be convenient, or entails greater inconvenience, the reason for it ceases to operate, and we do not advocate it. The real question is, what is that point? We may say that it differs for libraries of different size and characters.⁴

In the present study we too are interested in studying the nature of the point beyond which useful returns diminish.

The general claim was frequently made that minute classification would bring together the resources of a library on each distinct subject. William I. Fletcher explained that only a small proportion of such resources could thus be indicated. He pointed out the danger of suggesting substitution of classification for bibliographical research as a means of directing readers to subject material. Sensible classification, he said, is not intended nor adapted to guide beyond a most limited and general scope. He referred to the characteristics of too detailed classification in this way:

The more elaborate and thorough-going is your system, the more constant and considerable will be the changes dictated by one's own

⁴ C. A. Cutter, "Close Classification," *Library Journal*, XII (1886), 183.

progress in knowledge and the inevitable shifting of position on certain points, and much more by the constant changes in the crystallizations of the world's thought.

In a final protest: "This will-o'-the-wisp of close classification dances over the quagmires of inexperience, uncertainty and extravagance."⁵ Twenty years later, with added experience to his credit, he said: "Any very finely worked-up scheme is likely to become an object of veneration and a stumbling-block in the way of good, honest work in adapting the arrangement of a library to its needs and uses."⁶

Richard Bliss declared: "Even the most ardent classifier must admit that there is a point beyond which classification cannot be extended either with satisfaction or advantage."⁷

One pertinent comment was made by F. B. Perkins and J. Schwartz to the effect "that the process of infinite division implied in close classification separates, at each stage of its progress, parts from their wholes and thus actually defeats the very purpose for which it is made."⁸ To the experienced classifier this point may seem so self-evident as to be considered trite. He may say, as Henry E. Bliss has said, that any kind of classification will separate specific sub-classes from their relevant generic classes but that systematic classification will scatter specific subjects less widely than an alphabetical or another form of classification.⁹

This, indeed, is clear to librarians; yet the fact of this separation of parts from the whole has seemed worth presenting somewhat graphically to the reader, who may be generally unversed in principles of classification and completely at sea when he stands facing great numbers of books upon the shelves. For this reason, the principle of subordination, named later as the

⁵ W. I. Fletcher, "Close Classification versus Bibliography," *Library Journal*, XI (1886), 209-12.

⁶ W. I. Fletcher, "Bull in the China Shop," *Public Libraries*, XI (1906), 549-50.

⁷ R. Bliss, "Report on Classification," *Library Journal*, XIV (1889), 240.

⁸ F. B. Perkins and J. Schwartz, "The Dui-Decimal Classification and the Relativ Index," *Library Journal*, XI (1886), 37-8.

⁹ Letter to the writer, February 20, 1934.

third factor affecting the usefulness of any classified arrangement of books, forms the basis for the first study. In this is explained, in part, why so small a proportion of a library's material on a distinct subject is to be found under its specific class-number on the shelves. At the same time, other sources for tracing a subject have been indicated which are equally or more important and will often yield a greater proportion of material.

Samuel H. Scudder pointed out that only a small proportion of material on a scientific subject can be brought out on the shelves, that "in the sciences, a considerable part of the literature, especially that which deals with the original sources of knowledge, is to be found in the serial publications of learned societies, and in periodical literature."¹⁰ Scientific subjects of today embrace a wider area and include many fields in addition to those of the pure sciences to which Dr. Scudder mainly referred. His statement can now be extended to apply equally to the fields of the social, historical, and applied sciences, where much if not most original investigation is published in other than book form.

In contrast to the period of 1887 when Dr. Scudder wrote, we now benefit from the analytical work of the Library of Congress and other cooperative agencies; thus a part of the material to which he referred is now easily reached through the subject-catalog even if not so readily through consultation of the shelves.

Horace Kephart presented an interesting document before the World's Library Congress in 1893, in which he summarized the practice of classification as reported upon by the librarians of 130 of the then largest libraries of America. This discussion was limited to the arrangement of books on the shelves. Mr. Kephart summed up the opinions then expressed:

American librarians are substantially agreed that the books should be classified on the shelves in the order of subjects treated, rather than in that of accession, or chronologically, alphabetically, by size alone, or by any other criteria, leaving the sub-arrangement (under classes) to be determined by the requirements of each case.

¹⁰ S. H. Scudder, "The Arrangement of Books in the Libraries of Scientific Societies," *Library Journal*, XII (1887), 221-4.

The opinions dealt mainly with the representative merits of "close" as against "broad" classification; that is, with the arrangement of books and pamphlets in accordance with their most specific subject-matter as against an arrangement under broader groupings. Mr. Kephart concluded at that time: "The tendency is toward close classification but it is warmly opposed by many."¹¹

One weakness of many of these discussions and of their conclusions lay in the fact that those who expressed opinions were not agreed on the meaning of the term close classification. Some regarded it as anything beyond three figures of the Decimal Classification, others had visions of "being obliged to provide a separate place for every variety of animal . . . for every king that ever reigned."¹²

As already pointed out, its meaning even today is not precise. To seek a definition may perhaps be irrelevant and unnecessary. Fields of subject-matter are not uniform with respect to the kind or degree of subdivision which will prove practical, thus making impossible any general agreement as to what may be the most serviceable kind or degree of analysis. It has seemed desirable, therefore, to seek another basis for studying classified arrangements of books; such as, for instance, the use that can be made of the books when so arranged. Let us ask whether the reader who is in the habit of consulting books on the shelves, but who makes little use of the subject-catalog, is assured of finding accurate and fairly complete material on his subject under the class-number assigned to this subject.

A great deal of evidence is now available, if we will but gather and examine it, which will make it possible to determine the usefulness of classified arrangements of books which eventuate upon library shelves. Considerable pertinent information has therefore been collected and analyzed with the object of

¹¹ H. Kephart, "Classification." *Papers prepared for the World's Library Congress held at the Columbian Exposition*. 1893. p. 861-97.

¹² F. B. Perkins and J. Schwartz, "The Dui-Decimal Classification and the 'Relativ Index,'" *Library Journal*, XI (1886), 38.

finding out the nature of the actual use made possible through classification.

Thus the second study will reveal the percentage of titles on specific subjects standing under the specific class-number on the shelves, in proportion to the number of titles brought out in the subject-catalog by means of analytical entries and those standing under other class-numbers. Where it is found that detailed classification tends to bring together but a small percentage of this material, we may then prefer less subdivision of subject-matter for the shelves and seek, instead, other ways for tracing a greater portion of the pertinent material which classification has failed to indicate or has scattered. One such instrument of service is a well-constructed subject-catalog.

At the present time, with many years of experience in applying classification to books, librarians are in a better position to estimate the value and importance of detailed classification. Both of the present major systems, the Library of Congress and the Decimal, are expanding their tables on the principle of specific division of subject-matter, though with some important differences in degree and method. The adoption of these specific subdivisions for arrangement of books by some of our large libraries signifies substantial agreement in the value of this principle;¹³ it suggests also the acceptance of the implied general definition of the term close as being very specific subdivision. We are, therefore, assuming that enough librarians are agreed, ideally at least, in the value of this kind of classification for books on the shelves, to make a study of its actual usefulness worthwhile.

¹³ In seeking typical libraries in which to investigate the relationship between detailed classification and subject-cataloging, and the use made of classified books, the writer was not able to find many large libraries which were classifying their books in strict accordance with the modern expansions of the Decimal classification. Either they had retained old individual systems of very broad classification, or were classifying broadly under an early edition of the D.C. Other libraries, in attempting to classify minutely, had made innumerable changes and interpolations of their own which confused both the new and the old Decimal outlines and resulted in disorder on the shelves. This situation seemed to be due, generally, not to a denial of the value of such expansions, but rather to the almost insuperable difficulties standing in the way of their adoption.

Early arguments for and against the principles of detailed classification applied to books continued for barely two and a half decades. Then gradually, discussions regarding the fundamental and evolving aspects of the general subject died away. That is to say, less and less frequently were questions raised which related to the practical theory and general usefulness of detailed classification as a means of meeting the requirements of the readers. Outwardly, at least, the superior advantages of this form over all other forms were accepted. In place of theoretical discussions, there arose occasional descriptive and a few critical considerations of the existing systems which had by then taken fairly firm possession of the field.

These two and a half decades, from 1876 to 1900 and even later, may be considered a very important transition period, and a very interesting one, in the history of American librarianship. During this time, methods of routine and practice were being introduced which were tending to standardize the technical organization of all libraries.

This was especially true in the case of classification of books. The crying need which had long been felt for better arrangements of the books and for greater availability of subject-matter opened the way for placing varying degrees and combinations of emphasis upon proposals which seemed, in a convincing manner, to offer a practical and complete solution to the difficulty. Thus a radical change was made from the "fixed" to the "movable" location of books on the shelves, and from very broadly grouped materials to the "relative" position of every specific subject with respect to every other subject, as expressed through a detailed form of classification.

In the enthusiasm which the new ideas engendered the changes in the principles of the arrangement of books were readily accepted and have continued to be applied with little thought of modifying to any essential degree the principles upon which the original plan was based. Thus the Decimal

Classification,¹⁴ invented by Melvil Dewey in 1876, which "seemed simple and practical and admirably adapted to the principle . . . of *movable*, or *relative*, location of classes of books on the shelves and consequent *expansibility*,"¹⁵ was highly appreciated and quickly adopted. Librarians on the whole were relieved to think that the matter had been settled once and for all!

The principle of relative location once accepted seemed to lead logically, although it seems now somewhat short-sightedly, to the conviction of the fitness of the closest possible classification for very large collections of books, as expressed by the specific systematic position of each subject. One must keep in mind that such a system, to be ideally complete, would have to incorporate into its tables a place for every distinct topic within the larger fields which has been, is being, or is to be written upon. Clearly, these minute divisions would have to be based mainly, at any given time, upon a cross-section of the contemporary field of knowledge. Consideration could be given, it is true, to the past but little to its future organization, which obviously cannot be known. This should be kept clearly in mind, since the problem of fitting growing knowledge into a more or less static outline of subject-matter bears directly upon and militates against the usefulness of any such system which purports to be devised for future as well as for present use.

That the application of such systems may actually constitute a disservice becomes clear if one will examine the curious and meaningless arrangements of books which result from the use of schemes which are not even moderately up-to-date. For example, the forcing of contributions to modern physics into the 530 division of the Decimal scheme leads to juxtapositions which have no significance at all. It may well be a question, in cases of this kind, whether an alphabetical arrangement by

¹⁴ M. Dewey, *Decimal Classification and Relative Index* (13th ed. Lake Placid Club, N.Y., 1932), 2 vol. (Tables and Index)

¹⁵ H. E. Bliss, *The Organization of Knowledge and the System of the Sciences* (New York, Holt, 1929), p. 104.

author under a broad subject might not be preferable. One of our large observatories makes no attempt to use the decimal divisions for its mathematical books but has found it convenient to arrange them alphabetically by author under the large subjects, as algebra, trigonometry, and calculus.

The few clear and emphatic warnings against the extreme form of detailed classification which had been uttered in the early discussions seemed soon to be forgotten. The augured problems and weaknesses, however, foreseen in the beginning, have not disappeared, but have become far more serious with the passage of time. Few even of the warning voices could have gauged the degree of specialization in subject-matter that was to be reached during the first half of the twentieth century; or the steady increase in the volume of output of printed material; or the difficulties which such an age would present with relation to the application of classification to this material. The increasing complexity of problems of classification has, for some time, made it evident that attention should be given to the determination of limiting modes of procedure; and that the principles of classification should be carefully examined and adjusted to a changing situation, with less emphasis on the immediate present and more on the future situation.

The Decimal Classification, though widely adopted, has never, however, pre-empted the field. In the beginning, many of the larger, more institutionalized libraries seemed to hesitate. Some retained or developed their own systems. C. A. Cutter devised a scheme for the Boston Athenaeum which has since been used with some modification in a number of important libraries.¹⁶ The great importance of this Expansive Classification in library history lies in the fact that many of its best features were later incorporated into the Library of Congress system.

The Library of Congress system began to be developed for the use of that Library in the late nineties and is continuing its

¹⁶ C. A. Cutter, *Expansive Classification*, Part I: The First Six Classifications. (Boston, The Author, 1891-93), 160 p.; Part II: The Seventh Classification (Adapted to Libraries of over 150,000 Volumes) in sheets (incomplete, 1937).

expansion to the present day.¹⁷ Its origin in the needs of one large national library, with little thought of its adoption by other libraries, was thus expressed by its present librarian, Dr. Herbert Putnam:

How excellent a service if the National Library could adopt a classification which would become universally current. We have had visions of such a one. . . They have passed. It is a matter relatively indifferent as to whether a book occupies an identical position in relation to its class upon our shelves and upon those of any other library, provided we supply to that library a key to its position upon our shelves.¹⁸

The strength of the Library of Congress system is derived from the fact that it "has been evolved by actual application to a larger number of books than has any other system now in print."¹⁹ Mr. Charles Martel has pointed out that the elaboration of the scheme as such has never been sought but whatever seemed to require specification has been given.

It was recognized beforehand and confirmed over and over again, in the course of the undertaking, that no amount of preliminary study, consultation, and taking pains in the preparation of the provisional draft, could produce other than a largely theoretical scheme, more or less inadequate and unsatisfactory until modified in application.²⁰

Since the scheme has, in general, been built up steadily, step by step, as the books have been currently received in the library, it thus represents the most uniformly modern and practical system that we now have.

Mr. George H. Bushnell sees in the Library of Congress scheme "a very definite realization of the development of that ever-turning wheel of learning . . . it is likely to prove as the years roll by, less and less a 'dated' scheme and more and more an affair of almost unlimited possibilities."²¹ The wide use of

¹⁷ U. S. Library of Congress, *Classification*, published in parts. (Washington, 1898-date).

¹⁸ H. Putnam, "The Library of Congress as a National Library," *Library Journal*, XXX (1906), c2.

¹⁹ J. C. M. Hanson, "The Library of Congress Classification for College Libraries," *Library Journal*, XLVI (1921), 153.

²⁰ U.S. Library of Congress, *Annual Report* (Washington, 1911), 61.

²¹ G. H. Bushnell, "Notes by a British Librarian on the Library of Congress Classification Scheme," *Special Libraries*, XXIV (1933), 43.

the Library of Congress printed cards upon which the classification of the book is indicated has helped to forward the adoption of this system in many large libraries, chiefly among colleges and universities.

In 1929, *The Organization of Knowledge and the System of the Sciences*,²² by Henry E. Bliss, appeared, followed in 1933 by his *The Organization of Knowledge in Libraries*.²³ These books had been promised for over twenty years. Many librarians, both in the United States and in Europe, consider them to be the most exhaustive and fundamental treatments of the subject of the theory of classification and its application to books which we have.

In the first book the author discusses the organization of knowledge and experience and its relation to the organization of thought and intelligence. From this is derived an educational and scientific consensus which is considered as being grounded in a unitary order of nature and conditioned both by the individual and by the social mind. Upon this consensus the author bases his argument for the need for an improved system of classification for libraries.

In the second volume he criticizes, in the light of these conclusions, the prevailing systems in America and Europe and establishes a basis for an improved system. A third volume, published in 1935 and revised in 1936, embodies the proposed scheme of classification.²⁴

In line with the argument of the present study, judgment cannot be finally passed upon Mr. Bliss's system until it is widely available and until its results have been examined in terms of the actual use made of books under its application. If the scheme proves to be consistent with the proposed principles, including those relating to the adjustment of the system

²² H. E. Bliss, *The Organization of Knowledge and the System of the Sciences* (New York, Holt, 1929), 433p.

²³ H. E. Bliss, *The Organization of Knowledge in Libraries* (New York, H. W. Wilson, 1933), 335p.

²⁴ H. E. Bliss, *A System of Bibliographic Classification* (New York, H. W. Wilson, 1936), 343p.

not only to the consensus of knowledge but to the special purposes, interests, and size of libraries, it will be a constructive contribution to practical librarianship.

Referring again to the period when Mr. Dewey made the Decimal Classification, it should be kept in mind that the dictionary form of card-catalog, as we know it in its present structure, did not then exist. The classified catalog was at that time in favor in American libraries, and this, without doubt, influenced, if indeed it did not actually define, the form of the Decimal Classification. In this type of catalog the subject-entries were translated into the symbols of classification and added to the cards which were arranged, not in alphabetical order, but in accordance with these symbols. The arrangement of the books on the shelves thus was paralleled by the order of the subject-cards, except that the latter might and much later did contain, in a very few libraries, additional cards representing analytical entries or the additional subjects of a book, other than the one which determined the shelving. The classified catalog, in this form, became a kind of glorified shelf-list.

If, as already pointed out, it is impossible for a reader to comprehend off-hand a classified arrangement of books, it becomes doubly difficult to find one's way in a large assortment of classified cards. An indispensable adjunct to such a catalog is a detailed, alphabetical subject-index which will guide one to the specific subjects desired in the classified arrangement of cards. The alphabetical "relativ" index to the Decimal system has never been complete nor modern enough to serve as a key to a growing catalog and thus has proved inadequate from the beginning. Specific terms for modern subjects have failed to appear in this, the result being that, unless librarians inserted many subjects of their own, such entries were hopelessly lost in the classified arrangement of cards. It is evident that a seasoned, modern, and as near as may be, a fool-proof index is essential as a key to any classified catalog. This being extremely difficult to make, librarians have, in general, turned to a catalog of another form.

It is to be noted that, in building up the classified catalogs of the John Crerar Library in Chicago, the Engineering Societies Library in New York City, and the Technology Department of the Carnegie Library in Pittsburgh, each of which uses the Decimal system, special attention has been paid by the libraries themselves to the alphabetical subject-index. Modern and specific terms are included in this as soon as they are required. These three libraries cover scientific and technical fields, a fact which suggests that scientific literature lends itself to a systematic arrangement more readily than does that of the arts and humanities.

The particular strength of the classified catalog, already pointed out, lies in the fact that not only one but several card-entries for the same book can stand in the card-catalog; thus the various subjects or aspects of a book can be indicated in their different relationships. No matter where the books themselves are shelved it is made possible, through this use of added cards for each book, for the reader to survey a whole contemporary field of literature as it is spread out before him in logical order. Miss Margaret Mann states:

Necessarily, the degree of usefulness of the classified catalog depends on the worth of the classification scheme. A poor and illogical scheme will produce an equally poor catalog, and on the other hand, a good scheme, one which is logical, up-to-date, scientific and simple, will produce a catalog of uniform worth.²⁵

Many of the advocates of the classified card-catalog, however, though aware of its points of superiority to the dictionary catalog, are realizing that the adjustment of any scheme to a growing and changing body of knowledge is a serious one. No classified arrangement of cards, even though based upon and perhaps fairly representative of a contemporary cross-section of the field of knowledge, will nor can reflect its detailed organization a generation hence. Thus the usefulness of such a

²⁵ M. Mann, *Introduction to Cataloging and the Classification of Books* (Chicago, American Library Association, 1930), p. 239.

catalog decreases steadily as its logical order ceases to conform to a present situation.

Although the same limitations are, of course, true also of any classified order of books, experience may prove—indeed, we may say that it has proven—that a systematic order of books by subject-matter is actually the best order, on the whole, which we can devise for many fields of knowledge. Since this is the case and since the systematic order has generally been adopted in America, it would seem to be the part of wisdom to acknowledge its limitations and to attend seriously to the construction of a form of catalog which will not duplicate but will tend to overcome the weaknesses of the system of classification; in other words, a catalog which will definitely supplement the information derived from the latter.

This is the actual situation which libraries are in the midst of today. With a few exceptions, including the scientific libraries noted above, the classified catalog has given way to the dictionary catalog. This form was given great impetus in 1891 and 1904 when Charles Ammi Cutter published the third and fourth editions of his *Rules for a Dictionary Catalog*,²⁶ which include sections devoted to the arrangement of subject-entries. W. P. Cutter writes: "The modern dictionary catalog, now almost universally in use, is a monument to Charles Ammi Cutter."²⁷

Whatever factors may have brought it about, other than the inadequacy of the index of the classified catalog and the difficulty of keeping the systematic arrangement of subject-matter up-to-date, it is true that the dictionary form was in full swing by 1900. It has since developed into a remarkable instrument in which all entry words, such as author, title, and subject, are arranged, in accordance with certain rules, in one alphabetical file. Subject-entries thus found in alphabetical

²⁶ C. A. Cutter, *Rules for a Dictionary Catalog* (4th ed. Washington, Government Printing Office, 1904), p. 66-82.

²⁷ W. P. Cutter, *Charles Ammi Cutter* (Chicago, American Library Assn., 1931), p. 27.

position are related by numerous subject cross-references which, to the initiated, have a structural relation to the captions of the classification scheme. With the growth in the size of the collections of books in our large libraries, the dictionary catalog has, of necessity, become very large, and, in many respects, confused, unwieldy, and difficult to use. Problems, yet to be solved, have arisen with relation to the most practical arrangement of cards, the kinds of cross-references, and the use of the catalog by the public.

The dictionary catalog has proven useful for quick service in libraries because particular titles and subjects can readily be found. But far more than this is possible, since, through intelligent and skillful arrangement of its subject-cards, it can be made to serve the needs of the investigator who wishes to survey a field. Mr. Cutter and Mr. Hanson both draw attention to the fact that certain valuable features of a systematic catalog can be retained in the dictionary catalog: first, through the judicious use of cross-references which bind the entries together,²⁸ and then, through the use of inverted and subordinated forms of subject-headings which will tend to bring related topics together.²⁹

It is clear that the value and the dependability of such an arrangement are contingent upon careful alphabetizing and grouping of titles. Such grouping should be carried out in so far as it can be done without seriously violating the dictionary principle, in order to make the catalog of service to the students and investigators who are best served through the grouping of related topics. Being a flexible instrument, capable of receiving any number of cards considered necessary to represent the different important aspects of any book, the catalog definitely supplements the arrangement of books on the shelves.

²⁸ C. A. Cutter, *Rules for a Dictionary Catalog* (4th ed. Washington, Government Printing Office, 1904), p. 23, 79-80.

²⁹ J. C. M. Hanson, "The Subject Catalogs of the Library of Congress," *A.L.A. Bulletin* III, 385-97, *Papers and Proceedings* (1909).

Along with the general adoption of the dictionary catalog it should immediately become evident that the burden upon the system of classification was decidedly diminished. It has seemed to the writer that sufficient attention has not been given to this important fact by those who are advocating minute subdivision of systems of classification. In connection with the classified catalog the Decimal system had defined and controlled the arrangement both of the books on the shelves and also of the cards in the catalog. Under the newer form of catalog this was altered. The system continued to control the order of the books but no longer affected the card-catalog, now in alphabetical form. Thus the arrangement of cards, classification's most important and most flexible field of application, had been withdrawn from its aegis, leaving only the more bulky, composite books and other printed material to be classified.

Thus the picture was changed. The user of the catalog, seeking an individual book or group of books in the alphabetical order of cards, looks for symbols of classification, *i.e.* class-numbers, mainly as a means of sending for the particular books desired. The *meaning* of the symbol has little interest for him unless he himself has access to the shelves and wishes to look over other books on the same or on generally related topics. Then and only then the class-symbols serve to lead the reader to some similar or related books. One object of the present study is to determine the nature and amount of the assistance which is given the reader from the fact that he finds some books grouped under definite subjects.

The Decimal Classification, in its recent expansions of classes, has shown a tendency to go to a great degree of detail, in an effort, apparently, to incorporate a special place for every topic under a given subject which may have been written upon in the past or may be written upon in the present or future. In other words, it is making an effort to keep step with the almost infinite subdivision of subject-matter which is following in the wake of intensive specialization.

Miss Dorkas Fellows, the editor of the Decimal Classification, justifies the use of this extreme detail by explaining that it has been employed simply to indicate to the classifier the exact location in the table of the most minute point in a field; and that only in the most highly specialized collections would even an approximation be used.³⁰ This explanation was called forth by Miss Edwards' criticism of the recent expansion in Psychology concerning which she quoted Dr. Guthrie, Professor of Psychology at the University of Washington. He stated that "for almost one-half of the detailed sub-classes it would be impossible to find so much as a single journal article which would confine itself to that item."³¹

But would such minute classification ever be suitable for application to books? Can this be called true library classification? Do the requirements of the classification of books go beyond even those of journal indexing? Is it not, rather, that expansions of this kind partake of the nature of topical analyses of fields as found in tables of contents and captions of paragraphs in comprehensive treatises, than that they represent a true grouping of subject-matter as usually revealed in the general content make-up of books as written and printed?

An investigation, previously reported, shows that such topical analyses do not correspond to the general content of books. Calculations made in the John Crerar Library indicated that under the subdivisions of 522, where types of Astronomical instruments are enumerated under Practical Astronomy, about 79 per cent of the places had never once been used, 11 per cent had been used once, leaving only 10 per cent that had been used more than once; this covers the acquisition of books on Astronomy over a period of thirty-five years. In 523, Descrip-

³⁰ From a letter to Miss Thelma Edwards, Head Cataloger, University of Washington, 1931.

³¹ Cf. Minutes of Pacific Northwest Library Association Annual Conference, *Library Journal*, LVI (1931), p. 964,

tive Astronomy, 40 per cent; and in 525, the Earth, 55 per cent of the places had never been needed.³²

It is probable that a major reason for the tendency toward minute classification is to be found in the attempt at cooperation which has been made by the Brussels³³ and the American Decimal systems. Although the latter had originally formed the basis for the Classification décimale, this European scheme had, until recently, far outstripped its predecessor in the minuteness of its expansions. Of late years, however, the American system seems to be equaling or even outdoing the European system in the elaborateness of some of its own expansions. In some instances, it has adopted the detailed tables of the Brussels system almost literally; in other fields it has developed minutely expanded tables of its own, as in Agriculture, Forestry, and Psychology.

The wisdom of following or paralleling or outdoing the Brussels system in the degree of expansion is open to grave question, since the purposes for which the two systems are used are distinct and may well remain so. Many librarians in America regard a policy of infinite expansion of tables for application to books as wholly impractical. They consider that it is based upon a misconception of the major use that is made of the American Decimal Classification, namely, for the arrangement of books in thousands of public libraries in this country. This is a worthy function and one that will be warmly supported by these libraries just as long as the system does not become too complicated to meet their needs.

The Brussels system, as has been pointed out over and over again by its advocates, is being developed almost solely as a tool for the card-indexing of journal material and other forms of documentation. In order to describe more explicitly the

³² G. O. Kelley, "The Decimal Classification," *Library Journal*, LIV (1929), 289.

³³ Institut international de documentation, Brussels, *Classification décimale universelle* (ed. complète. Brussels, 1927-32), 3 vols. and index.

function of the body which issues this volume its name has been officially changed from Institut international de bibliographie to Institut international de documentation.³⁴

Thus most, if not all, of the British and European discussions regarding the use of the Classification décimale relates to the indexing of bibliographical material and to the arrangement of cards. Use of the long shelf-numbers as well as the intercalated zero, the signs of combination, the subdivisions by time, and the various other auxiliary signs are all admittedly unsuited for the arrangement of books. The experience of Mr. Sigmund von Frauendorfer, in connection with problems of classification at the International Institute of Agriculture in Rome, bears out this conclusion.³⁵

Dr. S. C. Bradford and Professor A. F. C. Pollard have frequently explained that the purpose in attempting to establish the Brussels classification as a standard universal tool is to produce, in so far as possible, an exhaustive index to the world's scientific literature; this index to be brought together in one place for consultation by the world's scientists.³⁶ Dr. Bradford states that its purpose is to meet "the need of a comprehensive index to recorded literature and is not related to arrangement of books on the shelves. . . . The classification is intended as a means of filing references by subjects so that they can be found as readily as possible."³⁷

Mr. J. C. M. Hanson describes the function of the Brussels system which, he says, "may be well enough for purposes of documentation. As for application to the backs of books . . . the notation is, for the most part, out of the question. This is

³⁴ E. L. J. "Bibliography and Documentation," *Library Association Record*, 3d ser. I (1931), 424-25.

³⁵ Sigmund von Frauendorfer, "Classification Problems in an International Special Library," *Library Quarterly*, IV (1934), 223-33.

³⁶ Cf. A. F. C. Pollard, "The Decimal Classification . . . and its Importance as a Key to the World's Literature," *Report Association of Special Libraries and Information Bureaux*, II (1926), 37-49.

³⁷ S. C. Bradford, "Bibliography by Cooperation," *Library Association Record*, 2d ser. V (1927), 253-259; also "Why the Science Library Adopted the Universal Decimal Classification," *Library Journal*, LV (1930), 1000-5.

an important fact that has not been given sufficient prominence by the men who are backing the Brussels classification." ³⁸

Even M. F. Donker Duyvis, Secretary of the International Committee on "Classification décimale," issues a warning when he says:

I take this opportunity to warn you against too minutely detailed subdivision in classification. It is a general mistake to aim at a very much subdivided classification. Exaggeration is a vice (here) as well as in anything else. If we subdivide it too much into details we shall block it up, and render useful future extensions impossible. . . . Whereas in the U. S. A. the principal use of the Decimal classification is for library catalogs (about 14,000 libraries), in Europe the main use is for bibliographical work. The latter requires minute classification, and especially in the pure sciences, a more judicious development than is necessary for the classification of library catalogues. It appears desirable to distinguish a "library edition" (of the extent of the American Dewey code) and a "Bibliographic code" (of the extent of the Universal decimal classification).³⁹

Within the past few years the minutes of the sessions of the International Committee on Intellectual Cooperation at Geneva have contained references to the Classification décimale. In 1929 the question was raised as to further cooperation with the Brussels Institute. The following year a statement was included to the effect that the Committee of Experts had decided that the only basis of cooperation was that of the classification of books in libraries. Later:

It is desirable that the Decimal classification should be developed and perfected so as to keep abreast of the progress and the increasing specialization of the various sciences, but that more consideration should be given to the needs of libraries than has hitherto been the case.

In 1931:

The organs of intellectual cooperation could not remain indifferent to this system, which, although unsuitable for the classification of books

³⁸ J. C. M. Hanson, "Library of Congress Classification for College Libraries," *Library Journal*, XLVI (1921), 151-54.

³⁹ F. Donker Duyvis, *Report on the Commission internationale décimale*, IV (1930), 14-15 of mimeographed copy.

in the major libraries, was of considerable importance for the classification of titles and for bibliographies.⁴⁰

From the above statements it is clear that the Brussels system is not being advocated by its promotors nor considered by those interested in it as a guide for arrangement of books. If minute classification there must be, it seems more logical and practical to apply it to cards which index mainly articles in journals, as the Brussels Institute is doing, than to books, as the American system seems to be advocating. The subject-matter of journal articles is, as a rule, more unitary and concrete in nature than is that of books, lending itself, therefore, more readily to indexing. But no matter how large a collection of books might grow to be, the books themselves would continue to be composite in nature, each book, however, capable of standing on the shelves under but one of its aspects; thus, turning the scheme into a veritable index to fields of subject-matter for application to books would never be called for nor could such a practice ever be justified. Whether such minute indexing of articles is practical in the long run even for a systematic arrangement of cards appears to be an open question.

There is little indication that the libraries of a scholarly nature in Europe desire to follow any closely subdivided system for the arrangement of their books. There are exceptions to this, as, for example, the Vatican Library which has adopted the Library of Congress system. Certain specialized libraries may favor detailed systems as, for example, the library of the International Institute of Agriculture in Rome, which has recently adopted an original system for its special field of agriculture.⁴¹

Many public libraries in England use the Dewey system of classification, usually in the form of an earlier edition. Public libraries in Norway and Denmark have greatly modified this

⁴⁰ Institut international de coopération intellectuelle, Réunion d'experts-bibliothécaires, *Résolutions adoptées par les experts-bibliothécaires*, (*Classification décimale*), 2 an., no. 16 (April 15, 1930), p. 192-194; also Dorothy W. Curtiss, "History and Achievements of the International Institute of Bibliography." Unpublished Master's thesis (Columbia University, 1932), 215p.

⁴¹ Sigmund von Frauendorfer, "Classification Problems in an International Special Library," *Library Quarterly*, IV (1934), 223-33.

system in order to adapt it to their national literature. There are several libraries in Europe which maintain classified card-catalogs arranged by the Decimal system, though the books themselves are not classified. Also, decimal symbols have been applied extensively to patents, not, however, for their arrangement, but in addition to the numbers of the various national patent systems. So far as the writer knows no large European library has adopted the recently expanded editions of either the Brussels or the Dewey systems for the arrangement of books.

M. Léopold Delisle, the former celebrated and scholarly librarian of the Bibliothèque nationale, recorded many years ago his opinion regarding the short-comings of the *catalogue méthodique*—criticisms which would apply even more forcibly to classified books on the shelves:

Le savant qui a exploré avec le plus de persévérance et de succès une partie même très restreinte, du domaine scientifique ou littéraire, est parfois fort embarrassé quand il s'agit de classer méthodiquement les publications relatives à ses études de prédilection. . . . Les meilleurs catalogues méthodiques, quand ils embrassent des collections très considérables, présentent beaucoup de classement fautifs, discutables et arbitraires. Une personne voulant savoir quelles ressources le Département des imprimés lui fournira pour son travail ouvre le Catalogue de L'Histoire de France . . . qui est uniquement consacrée au règne de Saint Louis. Quelle déception, si elle s'imagine qu'elle sera sûrement et complètement renseignée après l'avoir consulté.

The investigator will find good with bad works all together. He will fail to find, perhaps, the most important works of all on the subject of interest, since these may be shelved in sets and elsewhere.

"On se fait donc une complète illusion en supposant que le catalogue . . . doit signaler ce qu'il y a d'essential à consulter sur un sujet donné," especially since the last step demanded in any piece of research is consulting memoirs and journal articles which may not be entered in a catalog.⁴²

⁴² Bibliothèque nationale, *Catalogue générale des livres imprimés*, I (Paris, Imprimerie nationale, 1897), lxx-lxvi.

The Association des bibliothécaires français has expressed itself as to the superiority of alphabetical subject-headings over any classified arrangement of material. Regarding "le catalogue méthodique dit par *mots typiques* et la *classification décimale* . . . nous noterons seulement qu'ils reposent sur un cadre de classement et qu'aucun cadre de classement ne peut avoir la souplesse ni universalité d'un dictionnaire."⁴³

Critical discussion on the value of the systematic arrangement of the subject-matter of books is to be found in German and French literature; this relates, not to actual arrangement of books, but to that of the cards or subject-entries in large volumes, which stand for the books. In Europe, the privilege of access to the shelves of libraries has not been granted generally, nor, in the large libraries, has the need for it been insisted upon. This is one reason why the question of the usefulness of an arrangement of books and pamphlets by specific subject-matter has not forced its claim for serious consideration. It is probable, also, that such a classification has seemed, in proportion to benefit derived, far too costly to undertake, both as to the procedure itself and as to the amount of shelf space required for books when classified.

There is, indeed, little evidence that the desire for detailed classification of books is widespread in Europe. Some of the outstanding reasons, other than those of economy, which have doubtless influenced libraries to forego its adoption, are the following: The necessity of placing a book under but one subject even though it may treat equally of several subjects; a book or pamphlet on a specific subject may be contributing to more than one larger field, but can, of course, be placed in but one field; important contributions appearing in journals and series cannot usually be grouped with the subject; since it is understood that each specialist and scholar would like the books in his own field grouped about his own special interest, which may change

⁴³ *Règles générales proposées pour la rédaction des catalogues*, (Paris, Champion, 1929), p. 13.

from time to time, it is therefore evident that any one detailed arrangement cannot be equally and permanently helpful to everyone.

Let us restate these reasons in somewhat different form. Economy of procedure, lack of adequate space for the shelving of books, restriction of access-to-stacks, the absence of books which are in circulation, the composite nature of printed material in book-form, the doubtful value of any one detailed arrangement by subject-matter, plus the practical possibility of making alphabetical subject card-catalogs and indexes to the material, might explain, in great measure, the continuance of the present European practice of fixed location together with a very broad or even with no subject-classification at all.⁴⁴

Whether these are the conscious reasons for the lack of general interest in the relative or adjustable location of books on specific subjects, it is at least interesting to sum them up and consider them as basic. That they are sufficient for continuing the practice of fixed location is not suggested by the present writer.

Since detailed classification would appear to yield only very general and incomplete help in locating material on specific subjects, it may be argued that a well-made alphabetical subject-catalog for the material is far more flexible, allowing as it does for the expression of a greater variety of the aspects and relationships of subjects; it can come nearer to satisfying a greater number of the varieties of practical needs, provided always that the makers of such catalogs understand the needs that are to be met.

Having surveyed certain aspects of the historical and international situation with respect to the classification of books we shall now turn to a study of its function in library service.

⁴⁴ These and other elements which affect the usefulness of the detailed classification of books have been developed more fully in Chapter IV.

CHAPTER III

THE SUBJECT-APPROACH TO BOOKS: THE NEED FOR AVAILABILITY OF SUBJECT-MATTER

THE most intriguing as well as one of the most difficult problems with which librarians have had to deal has always been that of making available to their readers the subject-matter of the books. It has been said that in ancient times a subject index was never even dreamt of. Probably nothing of the kind, as we think of it today, can be traced before the fourteenth century.

Yet for many centuries libraries, through an extremely general systematic grouping of books, have shown the desire to make possible the subject-approach to books. The early college library which in 1743 printed a small *Catalogue of the Most Valuable Books in the Library of Yale-College, Disposed under Proper Heads*, which had been prepared "with considerable labour and pains . . . so that you may readily know and find any book upon any particular subject," was striving for the same goal as is the John Crerar Library at the present time, with its classified subject-catalog of some 500 drawers containing, in round numbers, 500,000 subject cards—namely, an indication of the subject resources of the library.

Yet, when we consider the attention which has been paid to the production of author-catalogs, it can truly be said that, in comparison with these, subject-cataloging has, on the whole, been neglected. Mr. R. A. Peddie regrets the fact that so much more thought is being given to the making of great author-catalogs than to classification and subject-cataloging. He cites as instances the new author-catalogs of the British Museum, the Bibliothèque nationale, and the Preussische Staats-Bibliothek. "The student of literature and of specific authors is catered for

everywhere, while the student of specific subjects is referred to . . . special bibliographies.”¹ These latter exist, as we know too well, only in a small minority of cases and are rarely up-to-date in content. Vast numbers of works of the highest importance on particular subjects are hidden under authors, hampering thereby the modern scholar who has become more and more impatient in his search for information on definite subject-matter.

It is well-known that the bibliographic art of author-cataloging has reached a high stage of excellence. Subject-cataloging and classification, later arrivals in the library arena, are yet in their infancy. The mastery of the subject-matter of books by the librarian, combined with a technique for making this sufficiently available to meet the needs of different types of library readers, suggests a possible avenue of usefulness which, once attained, would surpass all our dreams of service.

This type of service has rarely, if ever, been offered to the serious readers, hence it is not strange that we hear occasional comment to the effect that serious library patrons or research students do not expect expert help from the librarian. They make little use, it is said, of the subject arrangements as worked out either in the classification of the books or through the use of subject-headings in the catalog; neither of these satisfies their serious needs. It is supposed, the argument runs, that scholars and specialists will keep in touch with all of the literature bearing upon their subjects through their own observation and reading.²

Yet, in 1893, Sir Leslie Stephen said: “Books have increased so that the scholar even forgets what has been written on his own subject and requires a reminder.” Mr. Hagbert-Wright, librarian of the London Library, quoted this and added: “There

¹ R. A. Peddie, “The Great Defeat,” *Library World*, XXXIV (1931), 37.

² A. C. Coolidge, “Objects of Cataloging,” *Library Journal*, XLVI (1921), 737.

is a 'daily deepening drift' of books which obliterates and effaces all recollection and record of the older ones."³

It is thus very doubtful indeed if the

. . . scientific and the historical or even the classical scholar can put his hand upon the essential original sources and contemporary contributions in his own field without the aids of the library catalog. But could he do this, there can be no doubt that, in the development of new fields by such scholars or in the activity of the younger student in the process of becoming a ripened scholar, the subject and classified indexes must be leaned upon heavily if progress is to be rapid and assured. The great present day [reference and public] libraries with specialized fields will require experts in those fields, not only in the work of the selection of books but for adequate reference service and for the proper cataloging and classification of the books. A catalog which is produced by catalogers and classifiers, some of whom, at least, have a real interest, based on knowledge, in the fields in which they are working, can readily bring to light and organize material which would otherwise be lost to the most careful research worker.⁴

It would seem, therefore, that if the librarian is alert to the needs of the reader, the latter will accustom himself to and depend upon the service offered.

As already stated, libraries vary in their fields of subject-matter and in their purposes. Hence the difficulty will always exist of establishing rules for selecting and organizing subject-matter which can be uniformly adopted by all libraries.

The collection of the very small public library will usually consist mainly of fiction, with a few books on Aviation, on Modern art, on Russia, on Economic conditions; in fact, on any subject which is to the fore in public interest. Large public libraries, in addition to their general collection in which fiction and books of general interest predominate, will often specialize in particular fields, contingent perhaps upon large gifts made to the library; or upon some keen local interest, such as Local history; or upon definite community needs, such as books on Business, or on some other field which meets the requirements

³ The London Library. *Subject Index*, (London, Williams, 1909), Preface.

⁴ G. O. Kelley, "The Subject Approach to Books," *Catalogers' and Classifiers' Yearbook*, II (1930), 12.

of a particular locality. Their reference collections, too, are becoming increasingly specialized in nature.

University and college libraries base the selection of their books upon courses offered through the various departments and, in particular, upon graduate courses calling for highly specialized books.

The investigation of large special fields, such as law, medicine, theology, has from early times called for the establishment of libraries. Of late years published material in these and other major fields has increased in quantity to such an extent and has become so specialized in nature that special reference libraries, built around one or more large but definite areas of subject-matter, have multiplied in number. Thus we have scientific, engineering, historical, and many other large libraries devoted to definite fields and their collateral subjects, and used by students in those fields. These libraries are sometimes maintained by strong national organizations or they may be supported through endowment.

Specialization in its extreme form has led also to the appearance of many so-called "special" libraries, which now for more than a generation have occupied an important position in the library world and in the world of affairs. The increase of wealth, the expansion of education, the changes which have occurred in occupational opportunities, are all factors which have led to releasing vast numbers of workers from routine work. Thus they are forced to prepare themselves for other kinds of activity.

The older professions have raised the educational requirements of their members. Business and industry in all of their forms have demanded highly trained executives and experts. Banks and financial houses, insurance companies, manufacturing and engineering plants, department stores, welfare and other bodies, must train their personnel, meet the informational needs of the executives and staffs, and keep in close touch with similar and related activities elsewhere. The need of meeting these

definite requirements has led to the establishment of special libraries which, through highly specialized collections of books and other forms of printed material, can satisfy these educational and informational needs.⁵ These libraries owe their very existence to the specific needs of homogeneous groups of readers who are interested in definite subjects; thus the books must be selected and the material organized with these needs in mind.

A transition is shown here from the very general public library whose aim is to meet the diversified and general interests of anybody and everybody, to that type which endeavors to meet the specific needs of one homogeneous group; in other words, from the library which may be said to touch in a general way on every subject to the one which covers one subject in a specialized way.

Through the whole range, from the first type of library to the last, we detect a similar vein of endeavor toward bringing the subject-matter of books to the attention of readers. This tendency becomes stronger and its need more insistent as we approach the most specialized libraries. A casual and somewhat superficial interest in books must give way to a thorough grasp of their subject-matter by the librarian if he is to select and record them so that they will become highly available and thus valuable to his special patrons.

The public librarian has usually chosen books in the light of his own general information as to what he thinks the public may want or should want. Of recent years, however, there are indications that he is definitely studying the needs and interests of the individuals and groups which comprise the community served. An example of this is the survey carried out under the auspices of The Queens Borough Public Library.⁶

The more specialized collection, on the other hand, has been chosen and organized far more definitely with the specific needs

⁵ G. O. Kelley, "The Democratic Function of Public Libraries," *Library Quarterly*, IV (1934), 5.

⁶ G. O. Kelley, R. B. Sealock, H. B. Devereaux, *Woodside Does Read; a Survey of Reading Interests*, (Jamaica, N.Y. The Queens Borough Public Library, 1935) 244p.

of the user in mind; all phases of the development of a subject call for representation even though some phase may be of interest to but one or few individuals. To do this ably, the librarian requires an equipment that will enable him to select and organize his material in so far as possible so that the several points of view of the different investigators will be represented in some way.

Thus, in all types of libraries and, in particular, in those which specialize in definite fields, the responsibility for making subject-matter available is great.

Is it not evident, then, that if we are making and using our systems of classification and subject-cataloging for the purpose of aiding readers to avail themselves of the subject-matter in books, it would seem reasonable for us to pause at some point in our course and try to discover from the user's point of view whether our efforts are fulfilling this purpose to a reasonable degree. Obviously, the service which we are rendering can be tested out only in terms of the final result which is the actual use made of it by the readers.

To what extent are we prepared to meet such questions as the following:

What definite answer can we make to the reader's query: "Why do the methods of classification of books and subject-cataloging bring to light so small a proportion of the library's total material on a definite subject?" Or to the query: "Why are the books on the subject in which one is interested scattered in so many places on the shelves?"

Can one depend upon a detailed classified arrangement of books on the shelves to show the major and most important resources of the library in specific subjects?

Does the one order of arrangement of books within a definite field, which is based on a minutely subdivided system of classification, result in a degree of usefulness which is uniform for the various types of serious readers, each with special interests and requirements in that field? Is it not possible that less

minutely subdivided arrangements would meet a greater proportion of the needs of a greater number of readers?

What relation does the subject-cataloging of books bear to classification?

We should be concerned, then, with those methods of library procedure of the past and of the present, or as they might be altered for the future, which endeavor to reveal the subject-matter in books, namely, classification and subject-cataloging; the first process aims to produce a systematic arrangement of books based upon their subject-matter; the latter, as usually developed, aims to bring out the subject-resources of the library under both general and specific entries in the alphabetical subject-catalog. A thorough study of both processes and of their relationship will help to define their respective functions and will thus lead to a clearer understanding of their limitations as well as of their potentialities for library service. The beginning of such a study has been made in the present work in an effort to answer a few of the questions which have been raised.

What are the tools and the general principles of procedure which librarians have had for the work of classification? Have there been definite rules for guidance in definite situations?

A decimal scheme of classification together with very general principles of procedure were proposed over sixty years ago and rather quickly adopted by many general, moderate-sized libraries. The contents of these libraries were, to a large extent, the literary and religious rather than the scientific product of the corresponding period in the history of knowledge. As has already been pointed out in the preceding chapter, the procedure of classification was intended to be carried out in conjunction with a particular type of catalog, namely, the classified catalog.

As time has gone on the scheme has been expanded and rules for using it have been developed. Yet, at the same time, few vital signs of change in the conception of its nature and purpose have appeared. It has continued to be applied to situations where the contents of growing libraries have constantly

reflected the unfoldment of developing knowledge in nearly every field; where the subject-catalog has definitely assumed an alphabetical form of arrangement; and where, in a word, libraries differ in nature and purpose not only from the original general type but among themselves as well.

Such dynamic and mutable factors as these should call for a correspondingly flexible method of classification, one capable of recognizing and adapting itself to varying requirements as they arise. Such a system only, in its end-product which is the production of a truly useful arrangement of books on the shelves, can yield genuine help to the library patron.

There are librarians who will not admit the inflexible and static nature of the present procedure in classification. They will point to the vast expansions of present systems of classification as indicative of sufficient progress. True, this is development, but of a curiously one-sided and baffling nature.

If knowledge itself were static then it doubtless could be symbolized by unity in the form of a complete systematic outline of its subject-matter; not, of course, that this could express all important relationships. But we could assume, perhaps, that, after great striving on the part of specialists in definite fields of subject-matter, aided by librarians who were adept in library practice, a scheme might be arrived at, representing a certain period of time, that would be preferable to others, when measured in terms of the use it afforded to the greatest number of library readers. Such a scheme, being the product of a definite period of thought, would of necessity be static. Its prototype, the state of knowledge at the time, would change. Shortly, the initial coordination between existing thought and scheme is thrust out of harmony, and the practical troubles of the classification of books have begun.

What, for instance, has the Decimal Classification done in this situation? How has it cared for new topics, or for those which have gradually emphasized relationships other than the original ones? Its principle has been to retain its original basic

and more inclusive divisions, even though these concepts may be falling into disuse, and to build later topics upon these, by means of the decimal characteristic of infinite expansibility. In following this procedure, the so-called logical arrangement of the new subjects has sometimes been completely sacrificed in order, simply, to find for them a place in the sun.

In this way, the values of subdivision have been lost, since we find important, even basic, groups of literature and everyday activities subordinated to topics no longer of current interest, and allotted very long decimal numbers, which are unwieldy and cannot easily be memorized. In other words, since most of the three- and four-place decimal numbers are considered to have been pre-empted by major and older subjects and so must be retained, many of the newer topics, though of equal or even greater importance, are relegated to the subdivisions of the older subjects, resulting often in numbers, which may be eight, ten, or more places in length. One can easily visualize the resulting inadequacy of the relationships between the subjects appearing on the shelves.

Among these important, newer major topics we find fields which are based upon the interrelations of one science with another.

These are becoming more and more evident, making necessary the re-alignment, the synthetic renewal of the scope and boundaries of these sciences. This does not refer to the . . . simple relationship between two subjects, as Chemistry in the home, or Mathematics for engineers; it is where two or more sciences have become welded in such a way as to form new and major fields of investigation which take their places not as subordinate but as coordinate with the parent sciences. F. H. Giddings calls these the "marginal fields of research where domains of specialization meet." Examples are Ethnopsychology, Physico-chemical biology, Anthropogeography, Paleogeography, Biochemistry, Astrophysics, Meteorological optics, etc. The so-called principle of 're-interpretation' of old decimal places, as thought possible by some librarians, to take care of such new subjects, has been found impossible.⁷

⁷ G. O. Kelley, "The Decimal Classification; the Natural and the Applied Sciences," *Proceedings A.L.A. Catalog Section* (1929), p. 128-29.

One writer has pictured in vivid terms the analogy between the Tree of Knowledge, considered as a living organism, and library classifications:

Yet the supersession of all classification schemes that have been constructed in the past, and our increasing dissatisfaction with those now in use, may be attributed to the failure of their authors fully to comprehend this platitude. Some classifiers, having made a sketch of the Tree of Knowledge many years ago, think this still a satisfactory delineation. Dewey, realizing that the Tree is continually adding to its girth, thrusting ramifying roots further into the soil, and stretching multiplying twigs and branches towards the light, periodically expanded his scheme. But no one appears to have acted on the elementary observations that roots which fail to find nourishment, rot; that twigs which are overshadowed wither; that branches are lightning struck; that green shoots become the Tree's mightiest arms; and that physiological processes, while continually absorbing nourishment, are also continually exuding that for which they have no further use. In classification, as in nature, increase in bulk is not necessarily a sign of healthy growth. Health depends on hygiene. And in the Decimal classification there has been no excretion of waste-products. . . . Unless obsolete matter is rigorously expelled, the accessibility of current information is seriously impaired.⁸

Let us turn, briefly, to existing principles and rules of procedure for classifying books. These are seen to be either those which are general and fundamental in nature and are commonly applicable to problems arising from the practice of classifying books; or those of the nature of rules of procedure which have been generalized for definite types of cases.

These matters have been treated exhaustively in Mr. H. E. Bliss's recent book.⁹ Mr. W. C. Berwick Sayers' "Canons" of classification are well-known from their statement some twenty years ago and also in their more recent development.¹⁰ Dr. Richardson also stated principles which have, in part, been in-

⁸ E. B. Schofield, "The Future of 'Dewey,'" *Library Association Record*, 3d ser. III (1933), 248.

⁹ H. E. Bliss, *The Organization of Knowledge in Libraries* (New York, H. W. Wilson, 1933), p. 21-46, 143, 157.

¹⁰ W. C. Berwick Sayers, *Canons of Classification* (London, Grafton, 1915-16), p. 42-43.

corporated in the canons.¹¹ Some of these canons have always seemed vague and unnecessarily theoretical. It is, therefore, perhaps not surprising that in actual practice little attention has been paid to them.

Mr. L. A. Burgess, librarian of the Cardiff Public Libraries, has contributed an article entitled "The Canons of Classification: a Revaluation," in which he ventures to criticize them. He questions the philosophical soundness of some and the practicability of others. He "dissents strongly from the actual statement of several of all the more significant canons" and asks that they be revised "so as to bring them into line with Mr. H. E. Bliss's basic principles of 'subordination of the special to the general, gradation by speciality, and the collocation of closely related subjects for maximal efficiency'."¹²

Mr. Sayers separates his fundamental rules or canons of classification from the rules for classifying books. He makes of the latter, rules of procedure for definite types of cases.¹³ One is reminded of Mr. W. S. Merrill's *Code for Classifiers; Principles Governing the Consistent Placing of Books in a System of Classification*.¹⁴

Among Sayers' rules for classifying we find for the first time in his book the direction "Place the book where it will be most useful." One remembers the pointed statement made by William E. Foster many years ago that any system of classification for libraries "is a means to an end—not an end in itself" and that any tendency to regard it as apart from the use to be

¹¹ W. C. Berwick Sayers, *Manual of Classification for Libraries and Bibliographers* (London, Grafton, 1926), 345p.

E. C. Richardson, *Classification Theoretical and Practical* (3d ed. New York, H. W. Wilson, 1930), 228p.

¹² *The Library World*, XXI (1931), 3-10. H. E. Bliss, *The Organization of Knowledge and the System of the Sciences* (New York, Holt, 1929), p. xiii, 407-8, passim.

¹³ W. C. Berwick Sayers, *Manual of Classification* (London, Grafton, 1926), p. 223-30.

¹⁴ W. S. Merrill, *Code for Classifiers* (Chicago, American Library Association, 1928), 128p.

made of it by the readers should be counteracted.¹⁵ Dr. Richardson also states that the reason we classify is "to get those books which will be most used together. The books are collected for use, they are administered for use, they are arranged for use; and it is use which is the motive of classification."¹⁶

In this way we find the idea of *use* introduced. But ways of determining the most useful positions are not suggested. The authors seem to assume that their determination falls to the lot of the classifier who is to base his decisions upon his own analysis and interpretation of the internal evidence of the books.

However, experience in scientific and other forms of serious library service has shown that this responsibility for grasping the contents and judging the use that is to be made of scientific, learned, and specialized books cannot and should not rest entirely upon the classifier; unless, as is rarely the case, he has considerable special knowledge of the relationships between subjects and of the problems existing in the fields under consideration. With such equipment he would then be able to understand, and only then, both the accurate nature of the books in connection with other divisions of the inclusive field, and also the special requirements of the various groups to be served. Yet even then, though his decisions were intelligently arrived at, they might, at the same time, be justifiably debatable.

For it must be remembered that the serious readers in definite fields vary in their requirements according to their special interests. Hence, we cannot avoid the conclusion that even though an arrangement of books that is based on a detailed organization of subject-matter might satisfy one group of specialists it would not, in all probability, be of equal or similar help to other groups.

If the equipment of the classifier is such that he is aware of these complex and conflicting elements which affect any classification of books, his final decisions as to their placement

¹⁵ W. E. Foster, "Classification from the Reader's Point of View," *Library Journal*, XV (1890), c6.

¹⁶ E. C. Richardson, *Classification, Theoretical and Practical* (3d ed. New York, H. W. Wilson, 1930), p. 26.

can be relied upon to be of considerable use. But without sufficient knowledge his decisions can have little value for those who might be expected to depend upon the resulting arrangements.

To arrive at the greatest usefulness for the greatest number of readers, it would seem that classification, when applied to fields of growing knowledge, should be fairly simple; that is to say, of a nature that will express gross relationships rather than the less obvious and debatable ones. Less effort should be made to place books in accordance with minute subdivisions of subject-matter which might tend to be of temporary value, and which, as already suggested, may conform to the needs of very few readers. More attention should be given to the sorting-out of books into the larger, clearly related, and concrete groups of subjects, a method that will furnish general and reliable assistance to a greater number of people. The subject-catalog would then furnish a possible means for tracing the more minute topics which are considered important.

Long familiarity with the methods and results of classification and subject-cataloging in American library practice has made it clear to the writer that certain assumptions have been made as to their nature and value which have not been borne out in the results of actual practice. Important factors which should have entered into the forming of these opinions have been overlooked; these may, if brought to light, tend to modify the methods and change their emphasis.

What, then, are the general assumptions upon which the need for the classification of books has seemed to rest, especially for that form which is known as close or minute classification? What are the basic beliefs which are implied when a whole library profession accepts this need, almost without argument, insists upon its value, and, by acquiescing in its continuance, signifies approbation of the results achieved?

One librarian has said: "The first and greatest duty of the cataloger is to classify his books. For minute classification there

is no substitute.”¹⁷ Dr. C. W. Andrews, then librarian of the Massachusetts Institute of Technology, stated in 1893: “Where access to the shelves is free the closest possible classification seems to me desirable.”¹⁸ Dr. Melvil Dewey has said: “If a reader wishes to study the library’s resources at the shelves, he will be greatly helped by minute classing. . . . If a student’s specialty is shels, he finds all works and references on that subject in library 594. . . . Every subject . . . shows resources and wants as no catalog can.”¹⁹

Opinions thus expressed by wise librarians have been accepted almost without argument and have helped to mold the beliefs of the many. Those who are without sufficient experience in classification sometimes fail to recognize accurately either its possibilities or its limitations. Some tend to trust its results too implicitly, others may have concluded they are wholly unreliable. Neither credulity nor incredulity has led to sound judgment. There seems to be no doubt but that the systematic classification of books can be made to yield considerable assistance to the reader who goes to the shelves, but there is evidence to show that this may be much less than anticipated.

It should be kept in mind that assumptions and beliefs as to values of classification may not all be consciously at work in the thinking of librarians; none-the-less their logical consequences may follow. Unless the issues are faced squarely and carefully examined, there is danger, first, that the original assumed results will continue to be taken for granted without sufficient foundation; second, that discussions will continue to take place upon bases which have no existence in fact; and

¹⁷ A. Keogh, “Catalogs and Catalogers,” *A.L.A. Bulletin, Papers and Proceedings*, II (1908), C360-61.

¹⁸ Quoted in H. Kephart, “Classification and Synopsis of Reports from 127 Libraries on Systems of Classification,” *Papers prepared for the World’s Library Congress* (Washington, 1893).

The present writer, however, through contact with Dr. Andrews in later years, knows that he modified his earlier opinion. He felt the need for close classification in the classified card-catalog maintained by the John Crerar Library, but advocated a less detailed arrangement of books on the shelves.

¹⁹ Dewey, Melvil, *Decimal Classification* (Ed. 13. Lake Placid Club, 1932), p. 18.

thirdly, that, as a consequence, sufficient aids to library patrons will continue to be lacking.

Such is bound to be the case where conclusions have been arrived at without recognition of, and careful thought regarding, the difficulties which lie in the way of fulfillment. In other words, a poorly thought-out line of activity will, by the time the ultimate consumer is reached, have results and consequences quite different from those anticipated.

Several such assumptions, believed by the present writer to be untenable, seem to have been made by librarians; these have supported the idea of the value of detailed classification on the shelves of large libraries; and in one case, at least, has supported the idea of the present adequacy of subject-cataloging.

The evidence for the following assumptions is based upon close observation of prevailing practices in various types of libraries over a period of many years. It has become steadily clearer that, no matter what theoretical opinions certain librarians may hold regarding the values of these present procedures, the only possible basis for judging their actual usefulness is to be arrived at through observing and measuring the results of current practice.

In brief, librarians have assumed:

(1) That arrangement of books on the shelves by specific subjects will indicate the library's major and most important resources on any subject.

Evidence for this is to be found not only in the statements of librarians such as those quoted above, but also in the fact that many of them are adopting or planning to adopt, for practical use, the minutely expanded sections of the Decimal system; moreover, classifiers are continually asking for, or themselves inserting, specific places in the system for minute subjects.

(2) That a systematic arrangement of books by subject-matter, even though admittedly poor and out-of-date, is to be clung to and preferred to any other kind of arrangement.

Evidence for this is the fact that librarians continue to force books into systematic outlines some of which were made more than sixty years ago, and in some cases were not satisfactory even then. Since these now could have no present meaning save an historical one, it is impossible to express the subjects of present-day books correctly.

Nevertheless, though the captions and the systematic relationships are no longer tenable, librarians continue to use the outlines. Very rarely do they suggest the substitution of a simpler order of more permanent value, such as, shall we say, an alphabetical author arrangement or a chronological one by date of publication or of period treated, under the larger groups of subjects.

(3) That an arrangement of books according to a minutely subdivided outline of subject-matter, based mainly upon one contemporary cross-section of the state of knowledge, will continue to be helpful as the years go by, even though fields of subject-matter change in content and meaning.

Evidence for this coincides in some measure with that for the second assumption. Lack of sufficient intelligent and emphatic criticism relating to the impermanence and complexity of closely subdivided outlines, and, in general, to the many difficulties met with in applying them to books, adds weight to the evidence. It is true that the great length of class-numbers which results under extended expansions has been objected to; this has seemed to the writer, however, a somewhat superficial criticism dealing with the most obvious end-product, as it were, rather than being a genuine attack upon the roots of the difficulty.

(4) That the one arrangement of books will be of equal help to all types and groups of readers, even though their interests are totally different.

This is grounded upon a great deal of evidence. Classifiers in general too easily gloss over the needs of individual readers or groups of readers. Many of them appear to have accepted once and for all time the one systematic order as printed in the

system in use and consider that this need not be changed. The sharpest kind of criticism is sometimes heard from librarians of those readers who ask that a book be placed in a relationship not sanctioned by the system.

(5) That the resources of the library on a specific subject have been exhausted after the shelves have been inspected and the card-catalog consulted under the subject.

This assumption has often been made by the reader and sometimes even accepted by the busy librarian. It has been observed that the usual service to individuals is often meager in public libraries where the staff may be limited and where circulation demands are pressing. The average intelligent reader might well be shown more definitely how classification and subject-cataloging work, and to what extent he can rely upon these for finding his material. Far too often the reader fails to obtain what he needs because he does not know how to use the bibliographic aids, and because the library assistant does not have time to seek further than the catalog.

(6) That the work of classification and subject-cataloging can be carried on successfully in public libraries by library school graduates who have no special knowledge in the fields to be dealt with.

Evidence of this is to be found in the fact that library schools graduate their students without requiring of them special equipment in definite fields of subject-matter; and that, in general, librarians employ them for interpreting and classifying the subject-matter of books without special knowledge in the necessary fields. This irrational situation impresses the writer as being one of the most challenging plights facing librarians.

A thorough analysis and critical study of all these assumptions clearly would constitute an extensive and difficult task, but one worthy of the finest effort of our most scholarly librarians. A beginning, only, has been made in the present volume. We have sought to open the way for further examination of the

many factors, which, enumerated and briefly developed in the following Chapter, adversely affect the reliability and usefulness of detailed classification, thus seriously hampering the readers' use of books on the shelves.

The two investigations included in this study relate to the first assumption stated above, that detailed classification will bring together on the shelves the major and most important resources of a library on specific subjects. Thus a partial answer is sought to the questions already stated:

"Why do the methods of classification and subject-cataloging bring to light such a small proportion of a library's total material on a definite subject?"

"Why are the books in which one is interested scattered in so many places on the shelves?"

The first study seeks to explain simply and graphically "How systematic classification works," and how, by means of it, material on the same subject may be separated. This has been done through a structural analysis of the classification tables which, in general, have been built upon the principle of subordination of the special to the more inclusive subject.

One must remember always, in this connection, that two or three open pages of a printed subject-outline enable one to grasp the proposed structure of a whole field much more readily than does the consultation of a linear arrangement of books on the shelves in the same field. As suggested before, the relationships within the field are not clear in the latter case.

Hence, with emphasis constantly on the reader's actual use of books, it has seemed worthwhile to produce a replica of the scheme in terms of the books standing under the captions. The titles appearing in the subject-catalog, together with estimated amounts of material available from other sources, are given. Resulting percentages suggest the amount which one can expect to find under the specific number on the shelves in proportion to that which can be obtained through these other sources.

The second study seeks an answer to the question: "What percentage of the library's titles on a specific subject can one expect to find under the specific class-number on the shelves, in proportion to titles under the subject in the dictionary catalog?" The answer has been arrived at by means of an analysis of the total number of titles found under a large number of specific subjects in the dictionary catalog into the following three groups: (1) Titles on the subject found under the class-number on the shelves; (2) Analytical title entries which are shelved with the books or sets of which they are a part; (3) Titles on a subject which include, or are connected with, other subjects and which are shelved with the latter. This process was carried on with a large number of subjects in several well-organized libraries, and the average percentages for each group figured.

The results of both of these studies have thrown interesting light on the actual possible use of closely classified books on the shelves.

CHAPTER IV

THIRTEEN ELEMENTS WHICH AFFECT THE USEFULNESS OF CLASSIFICATION

WHAT then are the many factors, inherent and imposed, which have been referred to as affecting the usefulness of any classified arrangement of books? Thirteen such factors are here set forth. Numbers one to six are those which may be considered inherent in classification and, for that reason, cannot be changed; numbers seven to thirteen arise from present methods of operation and, to some extent, can be modified in such a way that service to readers will be improved.

1. The progressive development in the organization of knowledge inevitably makes any minutely subdivided outline of subject-matter begin to become out-of-date as soon as it appears. The very nature of systematic classification carries with it the seed of change, based as it is upon human concepts which are growing, developing, changing, being transformed, even disappearing. Changes in meaning and relationships often appear first in the finer subdivisions of a larger field and only gradually affect the whole. Thus it is that the major and fundamental branches of knowledge, and, to a lesser extent, the major divisions of these branches, are comparatively stable in nature. Where these divisions are carefully determined in accordance with an order which appears to be established by a prevailing consensus in the fields of knowledge, and arranged in their most helpful relationships, such order may prove useful and relatively permanent for many decades.¹

In fields where much of the accepted knowledge is authoritative and traditional in nature, as in the Catholic and certain

¹ Cf. H. E. Bliss, *The Organization of Knowledge and the System of the Sciences* (New York, Holt, 1929), p. 209-10, *passim*.

other forms of religion; or based upon a chronological arrangement of unique facts rather than upon the interpretation of their social significance in a modern world, as has usually, until recently, been the case in historical writings; or where subject-matter, secondary in importance, has given place to form or source of writing, as in literature, in certain parts of philosophy and religion, and in some sections of other fields; then the outlines of classification, when based upon these static characteristics, can be considered fairly permanent.

An excellent example of this type of classification where the body of subject-matter, being revelatory and dogmatic in nature, lends itself to a relatively permanent system, is to be found in a recently published classification for Catholic books.² Four general headings cover the field, namely, Christian literature, Theology including Liturgy, Canon law and Church history.

Each of these headings is subdivided upon principles which have already been firmly established. Thus Christian literature, including the collective works of the theologians and the sources of revealed religion, is divided by form, source, or period of writing. "Systematic theology follows as closely as possible the logical pattern for theological reasoning as indicated in the *Ratio Studiorum* for seminaries. . . . Church history is arranged in accordance with the standard historical divisions" while special topics under Canon law have been made to conform exactly to the code of the Papal Commission for the Classification of Canon Law.

But an entirely different picture is presented in the many active fields of growing knowledge which are developing and forming steadily under the pressure of unremitting investigation and which are adapting their ideas and methods of work to the demands of the ever-changing social situation. Here as well as in creative discussions of theoretical phases of subjects, any

² Lynn, J. M. *An Alternative Classification for Catholic Books* (Milwaukee, Bruce, 1937), 400p.

attempt at minute subdivision for permanent arrangement of books quickly becomes burdensome and soon takes on an "old-time" atmosphere, its value diminishing for future use. Thus a too-closely subdivided order in the fields, for example, of Psychology, of the Social sciences, of the Natural and Applied sciences, tends to become more of a hindrance than an aid to those who are familiar with, and are studying such fields, not only in terms of their immediate, current status, but with clear awareness of their linkage with the past and, above all, of the forces which are carrying them forward along the continuing, inevitable road of change.

2. It is probable that systems of classification, when applied to books, have resulted always in the expression of but one linear representation of subject-matter which permits but one subject-relationship to be shown at a time to the obfuscation of all other relations. This is due, of course, to the fact that a book can stand in but one place on the shelves. The system itself need not be considered one-dimensional, since it may have as many dimensions as it has types of expansions, whether chronological, linguistic, national, or another.

There is, however, a far greater variety in life than can be pictured in any one linear order, other aspects and relationships being equally or even more important. If one could go from a single linear order to arrangements which express two- or three-dimensional relationships at the same time, one would immediately make possible a more accurate placement of material, considering its aspects and the variety of uses to which it will be put. While it might, indeed, be possible to represent such systems graphically, it would, however, be impractical to apply them to books. In addition to the ordinary difficulties met with in using any system of classification, drawbacks such as the physical placement of the books and the handling of provision for growth along the different dimensions would make the adoption of a multi-dimensional system impractical. It is almost

certain that the increased usefulness of such arrangements would not justify the labor involved.

Yet, as stated above, the second- or third-dimensional meaning may be of equal importance with the first and should be recorded. Since expression through classification is denied, one must then turn to another kind of record for expressing these meanings; the instrument at hand is the alphabetical subject card-catalog which can be made to supplement the classification; this form of catalog is, in the writer's opinion, more practical to maintain than the classified catalog which reveals most of the weaknesses of the classification system. Through the use of subject-headings as many aspects of the book can be expressed in the alphabetical catalog as is thought necessary or desirable. By means of a careful construction of this form of catalog, based upon a wise and consistent choice of headings and references, and upon a skilful arrangement of cards which combines a modicum of the classified with the alphabetical order, the subject-catalog can be made to compensate for the deficiencies of the classification to a marked degree.

3. The process of subordination, by successive subdivision of subject-matter, separates at each step parts from the whole, thus tending in considerable measure to defeat its purpose of grouping like material together. This result is inherent in all systematic classification. Its practical result in the classification of books has probably not been duly appreciated. Greater and greater detail in subdivision may be expected to yield decreasing aid; this may be because it deals with minutiae beyond the reader's knowledge; or, as already pointed out, because the classifications represented by the detail are different from the reader's own; or because the amount of material brought together under a minute subdivision may be very small and sometimes negligible in importance.

Logical subdivision, ideally, aims to be exhaustive. In practical classification, however, there is in every field a point beyond which the forcing of topics into so-called logical subdivision

becomes meaningless and even confusing, and hence is of little use. Another order or grouping is then to be preferred: for instance, minute topics may simply be grouped together under the inclusive subject by an alphabetical author- or subject-arrangement, or even by date of publication. Wherever desirable, these specific subjects can be indicated in the subject-catalog.

The approach to the full use of any systematic classification, whether of books or of cards, depends upon a detailed alphabetical subject-index to the classified topics. There are cases where this alphabetical principle can be combined with the classification itself in place of a minutely subdivided order of small subjects which may be loosely related. The Library of Congress has found such a combination useful. Following the method of the Halle *Schema*, it has, in many instances, extended its subdivisions through an alphabetical arrangement of topics. To cite but a few instances: Inorganic compounds are arranged alphabetically by the chemical symbol of the principal element; under Cooperative production and Miscellaneous manufactures, the industries are arranged alphabetically; in Biology, the large classes and orders are arranged systematically, while the families and genera are alphabetized by name.

4. Although no imposed logical order by subject can be assumed to fall naturally within the outlook of the intelligent reader, other orders, defined in part by subject-matter, or by author, time, form, or place, can, to a considerable extent, be so assumed. Such, for example, are the alphabetical order by subject or author, noted above; the chronological order by period of author, by date of publication of the book, or by period treated; the form of writing; and the geographical order by region or political division treated, or by author's nationality. The accession order, used for the arrangement of books in some libraries, cannot be included here, since it conveys no meaning which relates to the intrinsic subject-matter of the books.

With the possible exceptions of the alphabetical subject-order where terms may change, and the regional order where

political changes may occur, arrangements of books based upon these orders would virtually be permanent. They could be counted upon to convey the same information fifty years and more from now that they do today—neither more nor less. Not only are such orders more readily comprehended and more permanent than the systematic subject-order, but it is true that certain fields, depending upon the nature of the subject-matter therein, lend themselves more readily to orders such as these. In fact, our present systems of classification make use of them in some cases. Philosophers are arranged by nationality, literary writers may be arranged alphabetically under form of writing or by period, and historical events in the order of their happening.

The suggestion implied in the above paragraphs is that, in view of the mutability of the strictly logical order which is not readily apprehended by readers, it might be advisable to extend the use of the more permanent and more easily understood forms of order where they can be combined with, or substituted for, the systematic order.

5. It is probably true that every student of a field sees that field in his own mind in some kind of an orderly pattern. This pattern differs with each student according to his central interest and to his method of approach to the special problem within the more general field which he is at the time studying. One professor of Sociology, interested in the statistical approach to sociological problems, thought of the subject-matter of the whole field of Sociology as grouped broadly under Historical aspects, Biological connections, and Social problems. He had no interest whatever in a conceptual or minute division of topics. Another professor, interested primarily in a conceptual organization of the field, carried in his mind a detailed, systematic outline of sociological concepts, grouped under the major divisions: Human nature, Community, Interaction, Socialization, Collective behavior, Institutions, Progress. Another, in the same field, grouped the major concepts under Societary composition, Causa-

tion, Change, and Products. Another, interested in the historical study of Sociology, shifted the material of the whole field and grouped it about periods and countries.

Thus at any given time the same concepts may be in the minds of students and scholars, but the relationship of one concept to another will differ. Students of the same general subject will rarely organize even the larger divisions in an identical manner, much less the finer subdivisions. In view of the variety of relationships present in the minds of those who use the books, the importance of any one detailed outline should not be overstressed. For without previous careful study and extensive memorization of the given tables, which is rarely if ever done, no one detailed order met with on the shelves can be utilized by different types or groups of readers to a fraction of its fullest possible extent.

It is true that the student, having been directed from the catalog to a definite subject on the shelves, will be greatly helped by finding considerable pertinent material under the one class-symbol. But it may happen that the grouping of the material to the right and left of the definite subject, being based upon a pattern which differs from his own, often seems too loosely related to the student's own subject to be of any great help to him.

In general, the greatest value to the user of a systematic arrangement of books, lies in his being able to locate groups of books on specific and concrete subjects readily, rather than in his reliance upon the relationships expressed.

6. The make-up of the subject-content of books as written and printed rarely conforms to any ideal or proposed outline of knowledge, and never to any proposed scheme of pigeon-holing; even the main subject or interest of a book may be debatable. The diversity of subject-matter found under the covers of single books renders the application of any scheme of classification to books only partially effective in bringing like material together on the shelves. Coordinate and cognate topics as well as those

of composite nature may be treated together in the same books, which makes the choice of single class-numbers difficult. Single topics may be treated from any one of several points of view, few of which are represented in the classification. An author's catholicity of interests may lead him to combine subjects which fall into widely different categories of the scheme; or, his own arrangement of, or inclusions in, the subject-matter of his field, as expressed in his book, may not coincide with the given outline.

Also, in periodicals, in commemorative volumes, in books of essays, and in other composite forms of publication, topics on different and very loosely related subjects are brought together. These must be classed under a broad class-number which will tend to cover all of the topics, and hence will separate the specific topics from their assigned places in the scheme. Such composite contributions tend to bulk large in the total output of some fields, notably the broadly scientific, where the results of research usually appear first in periodical form.

The results of classifying with the object of grouping specific subjects together have been studied in the second investigation. A variety of types of subjects drawn from many fields is dealt with. The results have indicated that the average number of titles on a specific subject which one can count upon finding on the shelves under its own class-symbol, in proportion to the number brought together under the same subject in the alphabetical subject-catalog, is about 35 per cent. In other words, considering the number of titles in the subject-catalog as 100 per cent—it is, of course, much less than 100 per cent of the total pertinent material in the library—one can expect to find on an average a little over one-third of this material in one place on the shelves. There is no assurance, moreover, that the most important contributions to a subject will appear under the class-number, since some of these may have appeared in a composite form of publication.

However, some of these insufficiencies of classification can be overcome through subject-cataloging. A book can, of course,

stand in one place only; hence we must depend upon the subject-catalog for bringing to light various other important aspects of the book. Yet even the subject-catalog cannot cover the book's subject-matter completely. Much of value will remain to be traced through bibliographical methods and aids.

7. From a practical point of view it is often considered inadvisable to re-classify whole groups of books, when newly constructed or more closely subdivided outlines appear. It is true, of course, that in some cases whole libraries have been re-classified, at great expense. Also, in most libraries, minor changes in classification are constantly being made, and a certain amount of expansion and revision in various classes and divisions is undertaken. The majority of libraries, however, choose a certain edition of the classification as the official tool, and build limited changes into that, instead of attempting to adopt the latest edition as a whole. The writer concludes, after careful observation in a great many libraries, that, in the great majority of cases, changes on a wide scale are undertaken rarely and reluctantly.

Limited cataloging staffs in proportion to the requirements of current work, the additional expense involved in work that is continually under pressure for greater economies, the doubtful value of extreme subdivision of subject-matter when measured in terms of probable use, are some of the reasons which influence many librarians to defer the adoption of expanded and changed tables.

In some instances, librarians adopt the new expansions for the current books, leaving the old books in the original order, with the idea that the latter will in time wear out and disappear. This wearing-out of books often is a long-drawn-out affair, the result being that like or related material remains separated on the shelves. On the other hand, this practice can be justified to some extent, since old books tend to fit as poorly into new schemes as new books fit into old ones. Apropos of separation by periods of time the suggestion has even been made that books

be grouped on the shelves by publication spans of twenty-five to thirty years or more and that classification schemes be made to conform to the same periods. A surgical operation would indeed be required to cut into the stream of knowledge in this fashion and it would seem that confusion on the shelves might be increased. Yet such a plan merits thoughtful study.

It has frequently been the case that librarians have felt themselves forced to expand certain tables or to have some specialist in the field do so for them; the result being that, when the same fields are developed in later editions of the scheme in use, it is usually deemed inexpedient to adopt the new expansions.

8. Preparation for the work of classification as given in library schools has consisted, in the majority of cases, in the mastery of the technique of the instruments to be used. Inadequate emphasis has been placed upon the need for a special knowledge in fields of subject-matter sufficient to enable the classifier to place the book in the best possible position within the field of which it is a part.

In the teaching of the Decimal system, considerable emphasis is placed upon memorization of the meaning of decimal numbers, familiarity with mnemonic features, facility in "building" numbers, quickness in using the alphabetical subject-index. For example, in an examination given in one of our library schools, thirty books were required to be classified in two hours; this meant four minutes for each book. If such piece-work production is demanded by the exigencies of modern library practice, can it be other than at the expense of service to the serious student? How often can an expert himself, with book in hand, get in four minutes even a rough picture of the contents of a book, and this where he attempts to classify it for his own use only?

To a considerable extent, the understanding on the part of students who leave our library schools is that classification has been learned once and for all. It has become for them a

standardized method that can be made to fit any problem. Yet the fact remains that much of the actual work which lies ahead of them will consist in applying the method learned to problems which may have evolved after the rules and tables of classification were made. This is, in one sense, the old story of the "lag" between theory and practice. Rules of any kind are based upon and are the outgrowth of factors and situations which exist up to the time such rules were made. They are put into practice and at once these same factors and situations, as aspects of an evolving social process, change. The "moving finger writes and having writ moves on," but it is a sad state of affairs when the rules, more or less mal-formed even at birth, remain intact to be applied to changing demands.

The importance which has been placed upon what may be called the technique of classification has led many, even librarians, to consider the work almost wholly mechanical. They tend to lose sight of its possibilities which may become apparent when rules and methods have been adjusted to modern and changing requirements.

The duty of the classifier is to assign those symbols to the books which will express their subject-content in relation to the subject-matter of the inclusive fields. As already suggested, library schools have given little attention to the training of the classifier in the fields in which he will be called to classify. Since there has seemed to be no way of determining beforehand which fields he is to handle, it has appeared hopeless to have him acquire training in subject-matter. The argument runs that of course he cannot be expert in every field.

Nevertheless, in the performance of his duties, the classifier is frequently asked to determine the subject-matter of abstruse and specialized books, to classify them in the best possible position and to assign the best possible subject-headings. That the outline of classification given him as a working-tool may have been drawn up for the general reader; that it fails to provide for many important and timely subjects; that, in the light of

modern developments, many of its divisions are arbitrary and illogical; that his own subject equipment is utterly lacking in special fields thus making it impossible for him to understand the specialist's requirements, are facts that he has not been taught to cope with and to surmount in rendering service to the serious reader.

9. Thus poor and faulty classification is sometimes the case due to lack of special knowledge in fields of subject-matter on the part of the classifiers, who may, for this reason, miss entirely the major or special import of the book. Detailed subdivisions of subject-matter enhance the requirements put upon the classifiers, and a sufficient knowledge in every field cannot be expected in view of the severity of the requirements. The writer believes, however, that there is a kind of special training that will give sufficient mastery of several fields to meet the requirements therein; this has been suggested under Groups XII and XIII of the problems proposed for investigation in the field of classification (See Appendix).

For where a classifier has little or no acquaintance with the organization of the field as a whole it is not to be expected that he can allocate a particular book to the place that will express its most useful relationship with other subjects. Many apparently alternative or "competitive" places are offered for the same subject so that one must understand the nature of and reasons for the distinctions if he is to choose the best place.

Classifiers who are unfamiliar with a field are driven continually to rely on what might be called "cults": e.g., the cult of catchwords in titles; the cult of the dictionary; the cult of encyclopedias whose information may be out-of-date or too difficult to understand without basic knowledge; the cult of imitation, that is, perpetuating a practice established earlier in the library by some person perhaps equally ignorant; the cult of acceptance, that is, accepting uncritically the Library of Congress or Decimal Classification numbers, as given on printed cards, without independent judgment as to their accuracy.

Cults such as these may be practiced habitually and the cumulative results recorded by classifiers, who may themselves at no step of their search have a first-hand knowledge of the book's subject-matter, nor of its relationship to other subjects within the field. In a word, they are totally unaware of the extent of the *mésalliance* which may have been perpetrated.

Let me hasten to say that much careful and intelligent work is everywhere carried on by classifiers. The minor proportion of cases, however, which fall justly under the above criticisms, steadily accumulate in any library and seriously diminish the value and reliability of the total final arrangements of books.

10. The class-numbers chosen by classifiers too frequently express the intrinsic subject-matter of a book rather than the purpose for which the book was written. As suggested before,³ one must know a field rather thoroughly before one can be sure of the use which a particular book will serve. One type of book whose purpose is clearly evident is where the material of one field is used as a tool to solve or explain problems in another; here the greatest convenience of the reader is served when the book is placed where it will be used. Thus, mathematics for engineers is to be preferred under engineering; statistical methods as applied to educational problems, under education; the physical laws underlying mechanical engineering, under the latter; applied X-rays under the field of application; ballistics of guns under guns; actuarial tables under insurance, and so forth. An important example of this is the extensive class of books which deal with the theoretical treatment of the engineering sciences. These books are wholly different in purpose from the purely experimental or laboratory type of investigation which one classifies without question in the pure sciences and they should be grouped with engineering. The purpose of a book, or the use for which it has been written, may well be a primary criterion for determining its classification.

³ Cf. p. 58.

11. Faulty and insufficient classification is often due to poorly constructed, incomplete, and out-of-date outlines of classification. Thus, even where the classifier may be well enough equipped to sum up correctly the subject of a book and to determine those relationships which would be most helpful to the greatest number of readers, he often finds it impossible to select categories which will express his conclusions. He is thus forced to select make-shift class-symbols which do not, perhaps even remotely, express the meanings desired. He frequently finds that he has been forced to assign a meaning to a symbol quite different from its original connotation, which by now may be completely outmoded.

Librarians may well pause before this dilemma which is a veritable Scylla and Charybdis of classification. To insert or not to insert new numbers, to expand or not to expand the tables when in dire need, those are the questions. In general, "home-made" changes are not advisable. Few librarians have sufficient knowledge to organize a whole field of knowledge which would be necessary before individual subjects can be placed in satisfactory relationship with other subjects. Furthermore, once such changes are made and used, the adoption of the more official expansions which appear from time to time is precluded. Moreover, the fact that new subjects can always be indicated in the subject-catalog, pending expansions, is a strong argument against making changes or additions of one's own.

The actual fact is, however, that librarians in general have felt forced to make individual expansions on a wide-spread scale and to re-interpret out-moded class-symbols. This has resulted in a steady accumulation of curious mixtures and absurd groupings on the shelves. Where elaborate modern expansions have been built upon basic divisions which are no longer recognized, a practice carried on presumably to avoid the necessity of re-classifying earlier books, the resulting arrangement of books on the shelves cannot help but present singular relationships.

Clearly, this practice does not tend to facilitate use for the individual who knows the development and the modern issues of a subject. This result was so evident in the recent expansion in Psychology of the Decimal Classification, that an additional, detailed scheme was offered where effort was made to determine the basic divisions in accordance with current conceptions.

The common story of professors, students and others who consult the shelves, that the arrangement of books found there grievously handicaps their use, has a causal history. This starts with the origin of a body which, far from perfect at birth, remains changeless in its major concepts even though time may all but have obliterated them; a body, whose dead beauty the guardian is taught to cherish, ending thus in a life that is a law unto itself.

12. The chances of finding pertinent material by direct consultation of the shelves is greatly reduced by the withdrawal of books for various reasons. For example, books may be in circulation or at the bindery; they may be shelved apart in special gift or rare book collections; they may be set aside for reserve use by study groups or groups of students; they may be shifted in position due to limitations of stacks, to oversize, or for other reasons. Also, where many readers use the shelves, serious disorder of the books invariably follows. In such cases, the shelf-list serves as a valuable tool to indicate the true order of the books and the complete resources of the library in definite fields.

From a wide observation in many libraries where the classification of books is considered important and is carried out fairly minutely, the writer has found few that have clear and adequate shelf directions and markings. Rarely are copies of the classification system which is in use easily available for those who are consulting the shelves. Lighting in the stacks is frequently far from sufficient to insure a convenient and dependable use of the books.

13. The long class-numbers used to denote very specific subjects lead to confusion of various kinds. The greater the number of symbols in a class-number, the greater the chances that mistakes will be made in copying them from the catalog-cards; that difficulty will be had deciphering the long numbers on the backs of books; and that mistakes will be made in shelving. Since the long numbers with 4, 5, 6, up to 8, 9, 10 places after the decimal point generally express minute subjects which may be treated in pamphlets more often than in books, the result is that the long numbers must be attached to the front cover, instead of to the back, of these slim pamphlets, and so are not visible unless each one is drawn out.

Summing up, briefly, the conditions which interfere with, and definitely limit, the usefulness of a classified arrangement of books, especially the order known as close classification, we have the following:

1. The changing order of knowledge, which makes impossible the static perfection of any classification system.

2. The inadequacy of any single linear representation of subject-matter for expressing the variety of its relationships.

3. The nature of systematic classification, which separates parts from the whole, and which sometimes results in forced and useless subdivisions.

4. The general obscurity and complexity of any systematic order in comparison with other more easily comprehended orders, such as the alphabetical or chronological.

5. The tendency of any student or specialist, or even the interested reader, to organize a field of subject-matter about his own special and immediate interest.

6. The content make-up of books, which, as written and printed, interferes with the satisfactory application to books of any system of classification.

7. The general impracticability of re-classifying old books on any wide scale, as new expansions and reconstructions appear.

8. The inadequacy of present training in librarianship for preparing students to recognize and to cope with many of the difficulties met with in the actual work of classification.

9. Poor and faulty work of the classifier in difficult and unfamiliar fields.

10. The too-frequent tendency to determine classification by the intrinsic subject-matter of a book rather than by the use or purpose for which the book was written.

11. Inaccurate and make-shift decisions due to poorly constructed and out-of-date tables of classification.

12. Absence of books and groups of books for various reasons from their positions on the shelves; also the unavoidable and marked disorder of books which are used frequently.

13. Long and confusing notation for very specific subjects.

All of the foregoing elements definitely and clearly limit the usefulness of detailed classification for the shelves. Briefly enumerated here, the need for careful study of each is apparent. A beginning, only, has been made in the following two studies. The first relates to the above factor number 3; it clarifies the effect of subordination of specific subjects to the more generic ones in separating parts from the whole. It also puts into somewhat graphic form the general steps that must be taken in order to ascertain the total material on a specific subject. The second relates in part to factor number 6; it shows how material dealing with the same subject may be scattered on the shelves, due to the physical make-up of books and to other causes.

CHAPTER V

INVESTIGATION NUMBER ONE

HOW SYSTEMATIC CLASSIFICATION WORKS

THE object of the present investigation is to explain how systematic classification works and to answer, in part, the query as to why it does not bring more material on specific subjects together in one place.

We shall lay out in tabular form the general steps which must be taken to ascertain all of the existing material on a specific subject both within and without a definite library. It is not our intention to compile accurate or exhaustive bibliographies on any of the subjects chosen for illustration. The object is, rather, to point out the succeeding general steps which would lead to the major sources for finding material on a given subject; and to indicate definitely, for any subject, the part which present-day classification and subject-cataloging play in bringing material to light, in proportion to the total amount in a library and also in existence. When this is shown in relation to other steps, the function of these forms of library procedure, both as to their possibilities and their limitations, will become clear.

The three subjects chosen for illustration, namely, the Beaver, the American bison, and the Cormorant, were taken from the field of Zoology. The principle of subordination used in systematic classification can be shown more uniformly and clearly in the Zoological and Botanical sciences than in other sciences. Similar results of separating material would, however, be evident in minutely detailed subdivisions of the Social, Physical and other sciences, though in many cases the actual subdivision of subject-matter cannot be carried out through such uniform steps.¹

¹The recent decimal expansion of Psychology is a notable example of extreme subdivision, being carried out in some places as far as ten decimal places. The expansion was too recent, however, to afford the writer examples of specific subjects with which to work.

TABLE I

THE POSITIONS OF BEAVER, BUFFALO, AND CORMORANT IN THE TWO
CLASSIFICATION SYSTEMS, IN RELATION TO THE SUPERORDINATE
GROUPS FROM WHICH THEY HAVE BEEN SEPARATED AND
WHICH MAY CONTAIN MATERIAL ON THESE SUBJECTS

Library of Congress system

Beaver

Zoology, in general	QL1-991	(esp. 3-99)
Zoology, geog. dist.	QL101-345	(" 101-225, 253-297]
Vertebrates	QL605-739	(" 605-607)
Mammals, in general . . .	QL701-739	(" 701-708)
Mammals, geog. dist. .	QL711-736	
Rodentia)	QL737.R6	
Beaver)		

Buffalo

Zoology, in general	QL1-999	(esp. 3-99)
Zoology, geog. dist.	QL101-345	(" 101-225)
Vertebrates	QL605-739	
Mammals, in general . . .	QL701-739	(" 701-708)
Mammals, geog. dist. .	QL711-736	(" 711-722)
Ungulata	QL737.U4	
Artiodactyla)		
Ruminantia)	QL737.U5	
Buffalo)		

Cormorant

Zoology, in general	QL1-991	(esp. 3-99)
Zoology, geog. dist.	QL101-345	
Vertebrates	QL605-739	(" 701-708)
Birds, in general	QL671-699	(" 671-677)
Birds, geog. dist. . . .	QL677-695	
Steganopodes)	QL696.S6	
Cormorant)		

*Decimal system**Beaver*

Zoology, in general	590-599
Zoology, geog. dist.	591.9
Vertebrates	596
Mammals, in general ...	599
Placentalia	599.3
Rodentia)	599.32
Beaver)	

Buffalo

Zoology, in general	590-599
Zoology, geog. dist.	591.9
Vertebrates	596
Mammals, in general ...	599
Ungulata Carnivora ..	599.7
Ungulata	599.71
Artiodactyla	599.73
Ruminantia ...	599.735
Pecora	599.7356
Cavicornia .	599.7358
Bovidae) .	599.73584
Buffalo)	

Cormorant

Zoology, in general	590-599
Zoology, geog. dist.	591.9
Vertebrates	596
Birds, in general	598.2
Natatores	598.4
Steganopodes)	598.43
Cormorant)	

From the foregoing Table it is clear that material on the specific subjects Beaver, Buffalo, and Cormorant, may appear in any or all of the superordinate subject groups.

The general steps to be taken in tracing all material on a chosen subject are outlined in Table II, Steps 1 to 12. These steps would, in each case, be adapted to the particular subjects; some subjects, for instance, would require a smaller number while some might require a greater number of superordinate divisions than the examples chosen, depending upon the degree and nature of subdivision. The bibliographies consulted would, in each case, belong to the field which included the chosen subject. Notice that Steps 1 to 12 are identical with but reverse the order of items under Table IV.

Tables III and V show the results of a search in one library for material on the subjects Beaver and Buffalo. The total number of entries with author, brief title, date, and number of pages, has been given for Items 1 and 7 (8 in case of Buffalo), which stand, respectively, for books with the specific shelving-number, and for entries, except those under 1, found in the dictionary catalog. The same information is given under items 8 (9) and 11 (12) if found. Pages, in part estimated, have been given under items 2 to 6 (7) inclusive, and 12 (13). Pages for items 10 (11) and 11 (12) have been determined in part by actual reference to the indexes; for example, the card index of the Concilium Bibliographicum was examined at the John Crerar Library and the page references taken down for both Beaver and Buffalo; the names of the periodicals were checked to find out whether or not they were in the library being searched. A sufficient number were checked to gain an idea of the proportion to the whole which were in the library. *Poole's Index*, *Readers' Guide*, and the *Zoologischer Bericht* were examined rather carefully to get an estimate of the gross number of references and pages. A certain amount of duplication of entries must have entered into the calculations, though a special effort was made not to duplicate the larger page entries.

TABLE II

STEPS UNDER WHICH MATERIAL ON SUBJECT IS TRACED

Step

1. Specific class-number for subject (for example, Beaver)
(Notice that in both L C and D C systems Beaver is grouped with other rodents under the superordinate division Rodentia)
- (2). Superordinate number for Placentalia (in D C only)
2. " " " Mammals, geographical distribution
3. " " " Mammals, in general
4. " " " Vertebrates
5. " " " Zoology, geographical distribution
6. " " " Zoology, in general
7. The dictionary catalog under the specific subject for material, in addition to Step 1; this material may be in analytical form, or shelved as secondary material out of Steps 1 to 6, or may fall in Steps 1 to 6 but be shelved permanently in special places.
8. Books and parts of books in the library which contain material not traced through Steps 1 to 7. This must be sought for through special bibliographies, footnotes, trade bibliographies, other library catalogs, encyclopedic articles, etc.
9. Periodical material on the subject which is in library. Consult the major general periodical indexes and those special indexes including subject of investigation;
e.g.
 - Poole's Index*
 - Readers' Guide*
 - Zurich Concilium bibliographicum*
 - Zoological Yearbook*
 - Zoologischer Bericht*
 - etc.
10. Periodical material on subject, not in library
Trace as in Step 9.
11. Books containing material, not in library
Trace as in Step 8.
12. All other material in existence.

TABLE III

THE TOTAL PAGES OF MATERIAL ON THE BEAVER
WHICH HAVE BEEN TRACED THROUGH THE STEPS OF TABLE II
IN THE UNIVERSITY OF CHICAGO LIBRARY

Step	Material traced	Pages	Total
1.	Specific class-number QL737.R6 (Beaver and Rodentia)... Bonn, Anatomie Castor- is atque chemica Cas- torei analysis, 1806	136	136
2.	Mammals, geog. dist.* QL711-736 (Europe, N. Am.)..... Audubon (12) Stone and Cram (5) Barnes (2) Herrick (10) Merriam (7) Seton (35) Others (50).....	121	121
3.	Mammals, in general* QL701-39 (esp. 701-8) Jennison (3) Others (15).....	18	18
4.	Vertebrates QL605-739 (esp. 605-7)	0	0
5.	Zoology, geog. dist.** QL101-345 (esp. 101- 225, 253-297, range as in 2)..... Various titles.....	100	100
6.	Zoology, in general QL1-991 (esp. 3-99)... Brehm, Bronn, Cam- bridge nat. hist., Riverside, Cuvier, Tierreich, Lydekker Borradaile, Guyer, Hutchinson, Wood, and about 35 other books.....	100	100
7.	Dictionary catalog under subject S21.A44..... Bailey, Beaver habits, 1922... no. 1078 QL1.S66 1926 Bailey, How beavers build..... QL1.S66 1922 Berry, Observations, 1924..... QL1.S66 1873 Brunet, On the habits..... QL1.C2 v.17 Camp, Excavations, 1918..... QL1.S66 1900 Dugmore, Outlaw, 1901..... QL737.R6D9 Dugmore, Romance, 1914..... (in Geol. dept.) QL1.C2 v.10 Taylor, Beaver, 1912..... QL1.C2 v.17 Holden, Osteological..... relationships, 1917 QL795.B5M5 Mills, In beaver world.....	31 3 11 1 19 5 225 2 39 227	

TABLE III - Continued

Step	Material traced	Pages	Total
	QL1.G2 v.17 Taylor, Revision.....	69	
	QL1.G2 v.12 Taylor, Status.....	82	
	Q11.W3 v.6 Warren, Some interesting beaver dams, 1905.....	8	722
8.	Books and parts of books in library containing material but not traced under 1 to 7		
	1. Allen, J. A. Castoridae. In Monographs of No. Amer. Rodentia. 1877.....	27	
	2. Scott, W. B. Hist. land mammals.** 693pp. 1913.....	20	
	3. Rhoads, S. N. Cont. revision No. Amer. beavers.....	22	
	4. Mearns, E. A. Prel. diagnosis of Castor. Proc. U. S. Nat. Mus. 1897. vol. 20:501-5.	4	
	5. Collett, R. Baeveren i Norge. Bergens Mus. Aarb.....	127	
	6. Encyclopedic articles*.....	25	225
9.	Periodical material in library*		
	Material found through: Poole, 10 pp. Readers' Guide, 168 pp.; Zurich Concilium Bib., 400 pp. Zoologischer Bericht, 100 pp.; Zoological Yearbook, 100 pp.; other periodical refer- ences, 100 pp.		878
10.	Periodical material not in library*		
	Found through: Poole's Index, 8 pp.; Readers' Guide, 75 pp.; Zurich, 200 pp.; other, 200pp.		483
11.	Books not in library		
	Traced as in 8.		
	1. Morgan, L. M. Beaver and his work, 1881... (contains article by Ely)	330	
	2. Martin, R. T. Casterilogia, 1892.....	238	
	3. Babcock, H. L. Beaver....New. Eng., 1925**	15	
	4. Hodgson, R. G. Raising beavers for profit, 1924.....	48	
	5. Warren, E. R. Beaver, 1927.....	177	
	6. Harting, British animals, 1880**.....	20	
	7. Abbott, H. Chief engineer, 1920.....	70	
	8. Taylor, J. H. Beavers, their ways, 1906...	150	
	9. Rogers, L. Rise of the red Alders, 1928...	190	
	10. Rogers, L. Ska-denge, 1929.....	217	
	11. Radford, H. V. History of the beaver, 1908	30	
	12. Hawkes, C. Shaggycoat, 1906.....	273	
	13. Chaffee, A. Brownie, 1925.....	90	1848
12.	All other material in existence**.....	300	300
	Total.....		4931

*Estimated, in part.

**Estimated.

The totals of the pages for the entries under Items 1 and 7 (8) are complete and accurate, and accurate for Items 9 (10) and 11 (12) in so far as found. The totals for the other items can be said to have a certain value in indicating the estimated amount of each in proportion to the other items and to the grand totals of all items 1 to 12 (13), which represent all material in existence, and of items 1 to 9 (10), all material in the library.

As stated in the beginning, our purpose has not been to compile an accurate or exhaustive bibliography. We have, rather, enumerated the general steps which must be taken to trace material on a subject; and above all, we have sought to distinguish from other steps, and to bring into relief, the rôles which subject-cataloging and classification play.

Finally, in Table IV, the order of items 1 to 12 of Table III is inverted as follows:

Column

- (1) Reading upward, pages are given for items 1 to 12, total at top.
- (2) Total for all material in existence considered 100 per cent; opposite items 1 and (7 plus 1) are their percentages of this total.
- (3) Pages for items 1 to 9 are repeated and totaled.
- (4) Total for all material in library considered 100 per cent; opposite items 1 and (7 plus 1) are their percentages of this total.
- (5) Pages for items 1 and (7 plus 1) are given.
- (6) Total of material under subject in catalog considered 100 per cent; opposite item 1 is its percentage of this total.

Results indicate roughly that 2.7 per cent of all material on the Beaver in existence, or 5.9 per cent of the total material in the library, or 15.8 per cent of the material under the subject in the catalog, is to be found under the specific class-number on the shelves. Also, 17.2 per cent of all material, or 37.3 per cent of the material in the library, is to be found under the subject in the catalog.

TABLE IV
DISTRIBUTION OF MATERIAL ON BEAVER SHOWN IN PERCENTAGES

	1	2	3	4	5	6
	Pages for all Mater- ials, Items 1 to 12	Per Cent of Item 1 and Items 7 plus 1, of sum of 1 to 12	Pages for Items 1 to 9	Per Cent of Item 1 and Items 7 plus 1, of sum of 1 to 9	Pages for Item 1 and Items 7 plus 1	Per Cent of Item 1, of sum of 1 plus 7
Materials Available						
All material on Beaver in existence.....	4931	100	...	...	...	...
Material not in library						
12. All mat'l. except 1-11..	300	...	...	...	...	...
11. Book material.....	1848	...	...	...	...	...
10. Periodical material....	483	...	...	...	...	...
Material in library						
9. Periodical material.....	...	...	2300	100	...	...
8. Books other than 1-7....	878	...	878	...	...	...
	225	...	225	...	...	...
7 plus 1.....	...	17.2	...	37.3	858	100
7. Dict. cat. except 1.....	722	...	722	...	...	...
6. Under Zoology, in gen'l.	100	...	100	...	...	...
5. " " Geog. dist..	100	...	100	...	...	...
4. " " " Vertebrates..	0	...	0	...	...	...
3. Under Mammals, in gen'l.	18	...	18	...	...	...
2. " " " Geog. dist.	121	...	121	...	...	...
1. Under Rodentia).....	136	2.7	136	5.9	136	15.8
Beaver }						

TABLE V

THE TOTAL PAGES OF MATERIAL ON THE BUFFALO
TRACED THROUGH THE STEPS OF TABLE II
IN THE UNIVERSITY OF CHICAGO LIBRARY

Step	Material traced	Pages	Total
1.	Specific class-number QL737.U5) Artiodactyla) Ruminantia) Buffalo Canada's wild buffalo Pams on buffalo.....	17 21	38
2.	Ungulata QL737.U4.....	0	0
3.	Mammals, geog. dist.* QL711-736 (esp. 711-22) Audubon (12) Stone and Cram (3) Barnes (3) Seton (56) Others (25).....	100	100
4.	Mammals, in gen'l.* QL701-38 (esp. 701-8).....	15	15
5.	Vertebrates QL605-739.....	0	0
6.	Zoology, geog. dist.** QL101-354 (esp. 101-225).....	50	50
7.	Zoology, in gen'l.* AL1-991 (esp. 3-99).... Brehm, Bronn, Cam- bridge, Cuvier, Riverside, Lankaster, Lydekker, Borradaile, Guyer, Hutchinson, Wood, about 35 other books.....	100	100
8.	Dictionary catalog under subject QL1f.H375 v.4..... Allen, Amer. Bisons 1876.. SK351.A5..... Amer., Bison Soc. Reports.. SK297.B8..... Branch, Hunting buffalo... Q11.U5 1887..... Hornaday, Extinction... AS42.Q6 no. 53.... Merriman, Bison and fur... J66 ser. no. 5219. To establish a range.....	254 249 239 181 19 34	976
9.	Books and parts of books in library containing material but not traced under 1 to 8 a. Hulbert, Historic highways..... b. Hornaday, Our vanishing wild life..... c. Hornaday, Wild life conservation..... d. Encyclopedia articles (general and sport)**	39 6 14 30	89
10.	Periodical material in library* Material found through: Poole, 15 pp. Readers'		

TABLE V — Continued

Step	Material traced	Pages	Total
	Guide, 175 pp.; Zurich Concilium Bib., 25 pp.; Zoologischer Bericht, 50 pp.; Zoological Year-book, 50 pp.; other periodical references, 50 pp.		365
11.	Periodical material not in library** Found through: Poole, 5 pp.; Readers' Guide, 66 pp.; Zurich, 20 pp.; other, 100 pp.	191	191
12.	Books not in library Traced as in 9. a. Amer. Bison Soc., 3, 5-date..... b. Aslagsson, O. Buffalo, 1931..... c. Baynes, War whoop and tomahawk, 1929..... d. Buckskin, pseud. Passing of the buffalo.... e. Canada, Bringing back the buffalo, 1926.... f. Garden, Did the buff. ever inhabit Iowa.... g. Goodman, Memoranda....bison..... h. Grinnell, Hunting Amer. bison..... i. Hawkes, King of the thundering herd..... j. Jones, 40 years of adventure..... k. Sanders, Trails through western woods..... l. Lydekker, Wild oxen..... m. Shoemaker, Pa. bison found..... n. U. S. Interior, Amer. bison..... o. Vosmaer, Beschryving....bison..... p. Whitney, Musk-ox, bison.....	689 126 152 50 5 77 2 55 299 100 57 11 60 43 10 60	1795
13.	All other material in existence**.....		200
	Total.....		3929

*Estimated, in part.

**Estimated.

In Table VI the order of items of Table V is inverted, results showing that 1.0 per cent of all material on the buffalo in existence, or 2.2 per cent of the total material in the library, or 3.7 per cent of the material under the subject in the catalog, is to be found under the specific class-number on the shelves. Also, 25.8 per cent of all material, or 58.1 per cent of the material in the library, is to be found under the subject in the catalog.

In tracing material on the Cormorant a different method has been followed, since so little has appeared in book form and so much in periodical form. Our object remains the same—that of explaining why so small an amount of material is to be found under the subject's class-number and in the catalog, in proportion to all of the material in the library and in existence.

2. Books in the library which class under Birds
Sign: Figure with acute accent ($\acute{3}$)
3. Books in the library which class out of Zoology and Birds
Sign: Figure, acute accent, double quote ($2''$)
4. Periodical references which are in the library
Sign: Figure alone (2)
5. Books not in the library (not divided as 1-3 above)
Sign: Zero with sub-number, acute accent ($0_2^{\acute{}}$)
6. Periodical references not in library
Sign: Zero, sub-number, (0)₂

TABLE VII

THE 190 REFERENCES OF THE CORMORANT ARE HERE DIVIDED INTO THE PRECEDING SIX DIVISIONS, BEGINNING WITH THE FIRST ONE WHICH HAS ONE PAGE AND ENDING WITH THE LAST WITH FOUR PAGES

1 - 1 - 1 - 1 - 1ⁿ - 0 - 0 - 1 - 0 - 0 - 4 - 7 - 0 - 0 - 1ⁿ - 1 - 1 -
1 1 1 3

9 - 0 - 7 - 0 - 5 - 0 - 0 - 2ⁿ - 1 - 0 - 1 - 1 - 1 - 1 - 1 - 1 - 3ⁿ -
1 1 10 2 1

1 - 1 - 1 - 1 - 1 - 1 - 2 - 1 - 1 - 0 - 1 - 1 - 1 - 1 - 3 - 3 - 5 -
2

4 - 0 - 3 - 10ⁿ - 7ⁿ - 1 - 3 - 0 - 2 - 4 - 2 - 0 - 0 - 36 - 5 - 0 - 1ⁿ -
1 1 28 3

0 - 1 - 3 - 7 - 1 - 2 - 0 - 1 - 1 - 0 - 0 - 1 - 0 - 2 - 2 - 0 - 3 -
3 1 1 1 1 1

2 - 2ⁿ - 0 - 0 - 2 - 2ⁿ - 2 - 2 - 3 - 0 - 4 - 1 - 0 - 1ⁿ - 0 - 1 - 0 -
1 1 2 1 1 1

1 - 0 - 0 - 8 - 1ⁿ - 2 - 0 - 0 - 0 - 1 - 0 - 0 - 0 - 10 - 0 - 0 - 1ⁿ -
1 1 1 2 2 1 1 3 4 5

6 - 3 - 1 - 1 - 1ⁿ - 1ⁿ - 0 - 0 - 0 - 1 - 4 - 3 - 0 - 1 - 1 - 3 - 0 -
1 1 1 2 1

1 - 0 - 2 - 2 - 0 - 0 - 0 - 1 - 0 - 1 - 1 - 20 - 9 - 4 - 0 - 0 - 2 -
3 1 1 1 1 1

0 - 3 - 1 - 1 - 0 - 5 - 1 - 0 - 0 - 0 - 1 - 2 - 0 - 2 - 1 - 3 - 0 -
1 17 1 6 1 1 2

2 - 0 - 3 - 0 - 3 - 0 - 0 - 0 - 1 - 9 - 0 - 0 - 0 - 0 - 0 - 1 - 0 -
5 14 2 1 1 2 1 1 2 2 1

2 - 0 - 4 -
1

THE CLASSIFICATION OF BOOKS

TABLE VIII

PAGES OF MATERIAL ON THE CORMORANT FOUND UNDER THE SPECIFIC CLASS-NUMBER, IN THE DICTIONARY CATALOG, AND UNDER THE SIX DIVISIONS ENUMERATED*

No.	Location	Distribution of Titles	Pages for 190 Titles	Pages for 822 Titles
1.	Specific class number.....	Lewis, Natural Hist. ...	94	94
2.	Birds.....	1-1-6-6-4-5-1-2-4-3-2-2- 2-3-4-2-1-1-1 190:822::50:x.....	50	216
3.	Zoology.....	2-10-7 190:822::19:x.....	19	82
4.	Dict. catalog in addition to 1	Laufer..... Taverner.....	6 24	30
5.	Books in library out of Zoology....	1-3-1-2-2-1-1-1-1-1..... 190:822::14:x.....	14	60
6.	Periodical material in library.....	1-1-1-7-1-1-9-7-18-3-3- 5-1-3-2-4-2-36-5-1-3-7- 4-3-2-2-2-2-3-8-1-10-6- 3-1-4-3-1-1-3-1-2-2-1-1- 1-1-20-9-4-2-3-1-1-5-1- 1-2-2-1-3-2-3-3-1-9-1- 2-4- 190:822::268:x.....	268	1159
7.	Periodical material not in library....	1-3-1-1-2-3-28-3-5-2-5- 2-2-1-1-3-4-5-3-3-4- 6-2-2-1-2-5 190:822::103:x.....	103	446
8.	Books not in library.....	1-1-10-2-2-4-1-1-2-3-17- 1-1-5-14-4 190:822::69:x.....	69	299
9.	All other material..	No more. Bibliography with 822 titles considered exhaustive...		...
	Total		...	2386

*The pages in the bibliography of 190 titles are given first, then the proportionate number of pages calculated for the 822 titles.

Assuming that the amounts found under the above six divisions for the 190 titles will be proportionately true for the 822 titles of the complete bibliography, we calculate in Table VIII the pages for the latter under each division. For example, if there are found among the 190 titles 50 pages on the Cormorant in "Books in the library which class under Birds" (Item 2), we will then suppose that the 822 titles will yield a similar proportion of pages in books in the library classed under Birds. We calculate this as follows:

$$190:822 :: 50:X$$

Then X equals 216

TABLE IX
DISTRIBUTION OF MATERIAL ON CORMORANT SHOWN IN PERCENTAGES*

Materials Available	1 Pages for all material Items 1-9	2 Per Cent of Item 1 and Items 4 plus 1, of sum of 1 - 9	3 Pages for Items 1-8	4 Per Cent of Item 1 and Items 4 plus 1, of sum of 1 - 6	5 Pages for Item 1 and Items 4 plus 1	6 Per Cent of Item 1, of sum of Items 1 plus 4
All material on Cormorant in existence.....	2386	100	...	...	...	...
<u>Material not in library</u>						
9. All material except 1-8.	0	...	...	...	...	...
8. Book material.....	299	...	...	...	...	...
7. Periodical material.....	446	...	...	...	...	...
<u>Material in the library</u>	...	...	1641	100	...	...
6. Periodical material.....	1159	...	1159	...	...	...
5. Books other than 1-4.....	60	...	60	...	...	...
4 plus 1.....	...	5.2	...	7.5	124	100
4. Dict. Cat. except 1.....	30	...	30	...	30	24.2
3. Under Zoology.....	82	...	82	...	...	...
2. Under Birds.....	216	...	216	...	...	...
1. Stegenopodes) Cormorant)	94	3.9	94	5.7	94	75.8

*Results indicate roughly that 3.9 per cent of all material on the Cormorant in existence, or 5.7 per cent of the total material in the library, or 75.8 per cent of the material under the subject in the catalog, is to be found under the specific class-number on the shelves. Also, 5.2 per cent of all material, or 7.5 per cent of the material in the library, is to be found under the subject in the catalog.

The question may now be asked: Is the material on the Beaver, the Buffalo, and the Cormorant, found under the various items, of equal importance? Is one assured of finding the material on a subject which has most scientific value or which is most important to the greatest number of library readers, in any one place or through any one of the sources mentioned; for example, under the subject's number on the shelves, through the dictionary catalog, through periodical references, or elsewhere?

General answers, only, can be made to questions of value. Examining briefly the nature of the entries, we note the following points. The only book shelved under the specific class-number for Beaver is in Latin, with 136 pages, published in 1806, and has something to do with the use of the Beaver in medicine. Two more books on the Beaver are traced through the dictionary catalog, one shelved permanently in the Department of Geology, the other with Habits of animals in general. The remainder of the titles in the catalog are analyticals, all of which, including the last two named books, are modern, by well-known authors, and clearly appear to be of greater importance than the book under the class-number on the shelves.

Two short contributions on the Buffalo, totaling 38 pages, appear under the specific number. The dictionary catalog brings to light 976 pages, among which we find the following outstanding contributions: Allen's *American bisons*, 1876; some of the *Reports* of the American Bison Society; and Hornaday's *Extirpation of the buffalo*, 1886-87, which probably did more than anything else to check that extermination. No two of these stand together on the shelves.

In the case of the Cormorant, 94 pages appear under the class-number, constituting an article by an authority on the subject. Thirty additional pages come to light in the catalog, the remainder of the 1641 pages being traced by other means.

For the scientific subjects which we have chosen for illustration, we may say that the items comprising the superordinate groups and the periodical groups often furnish the source material out of which the books and analytical articles are written. There is probably no reliable way of estimating the different or relative values for these latter items. One cannot be assured that existing books will sum up current information on a subject. Subjects differ in nature, some being in active stages of development, accounts of which have not yet reached book form, but which must be traced through current periodical literature only. Other subjects have become static and show few signs of growth

of any kind; thus a few of the older books might rightly be expected to include everything of importance.

Since the physical form in which a contribution on a subject appears has little dependable relation to the value of the contribution, we have no reliable way of knowing where the most important material will be found. A serious danger lurks here for those who use the books on the shelves. Where a specific class-number has been assigned to a subject one is led to suppose off-hand that the major and most important contributions are to be found under that number on the shelves. It is a fact that many readers who use the shelves have been led astray by this supposition and have missed finding what they needed.

The present study, then, shows that for three definite subjects only about 2.2 per cent, 5.9 per cent, and 5.7 per cent of the total material in the library on those subjects is to be found under the class-number. For other subjects a greater percentage might, of course, be shown. Yet were this so, it does not hide the fact that consultation of the arrangements of the books furnishes only the merest starting-point as a means of locating everything desired on a given subject. The study has clarified the principle of subordination which separates special subjects from the more inclusive ones containing them, and which plays so large a part in most systems of classification; it has also thrown light on the part which the subject-catalog plays and has pointed out further general steps to be taken in locating material.

We turn now to the second study in which we shall examine the effect of the physical form of publication as well as of other elements upon the grouping of subjects, the main object being to determine the average amount of material on a specific subject found under its class-number on the shelves, in proportion to the amount made available under the same subject in the dictionary catalog.

CHAPTER VI

INVESTIGATION NUMBER TWO

DISTRIBUTION OF TITLES UNDER SPECIFIC SUBJECTS IN THE DICTIONARY CATALOG

CERTAIN principles of procedure which underlie classification and subject-cataloging and which are considered by the librarian to be almost axiomatic, are not understood by the patron of the library who has had little or no training in these fields. Without this familiarity with technical rules for classifying and cataloging, it is not clear to the reader why important material on a subject is often not found on the shelves under the subject's class-number nor in the subject catalog.

Investigation Number One has stressed the manner in which systematic classification works. It has explained why, due to inherent qualities in this form of arrangement, one cannot expect to find the total material on a subject standing together on the shelves. The illustrations used have clarified, also, the way in which the subject-catalog and bibliographic tools supplement the classification.

In addition to these inherent qualities of systematic classification, there are many other factors which adversely affect both the grouping of like material on the shelves, and also the appearance of certain titles in the subject-catalog. Frequently, for example, the content make-up of books and the physical form in which material is published make impossible the grouping of similar subjects. It is true that books of single purpose, published separately, can usually be placed according to a modern scheme. But in the case of books of dual or manifold purpose classification for the shelves can be made to express but one purpose; also, for composite books, treating of two or more

subjects, classification can express but one subject; contributions published in monographic series, in periodicals, in encyclopedias, cannot, as a rule, be touched by classification but must usually stand with the set. Factors such as these affect the way in which the librarian classifies his material and emphasize the important extent to which subject-cataloging must be relied upon to supplement the classification.

Even in the subject-catalog the reader may not find the material which he needs. He may not be aware that the policy of the librarian is not to duplicate to any great extent the work of periodical and other union indexes; it is assumed that these are well-known and easily accessible to the reader. The librarian rarely considers that extensive analysis of composite books is practicable for his own library; wherever it is possible he will, of course, take advantage of analytical work done by the Library of Congress and of other undertakings in cooperative cataloging.

In classifying his books, then, the librarian has set up rules of choice and procedure, reasons for which make these rules self-evident and necessary to him, but which, as has been said, are not clearly and easily understood by the reader. To the latter, unversed in library technique, the form of publication in which his material appears plays a decidedly secondary rôle—it is the subject which he is after that is the important thing for him.

To what extent, then, does a classification applied to books and to other forms of printed material succeed in bringing similar material together on the shelves? How does this amount compare with the number of titles of books on the same subject brought together in the dictionary catalog? What is its relation to the material on the subject which is to be found in connection with other subjects?

In the present investigation we have attempted to answer these questions through a comparison of the number of books on definite subjects found under certain class-symbols on the shelves with the number of titles which appear under equivalent

subject-headings in the dictionary catalog. This has been done in four large, well-organized libraries, two of which use the Library of Congress Classification and two the Decimal Classification. A number of subjects has thus been tested, considered sufficient to indicate the average number of books on any subject which one may expect to find on the shelves under one class-number in comparison with the number reached through the catalog.

To make such a comparison accurate the subject represented by the symbol of classification should be equivalent to a definite subject-heading; that is, the symbol should comprehend but the one subject and the subject should refer to one symbol only. Can we find this relationship?

The terms interpreting the symbols in a scheme of classification are, we find, by no means always equivalent to, nor interchangeable with, subject-headings. There seems to be no readily apparent organic connection between the two, since we think of the two tools, the system of classification and the list of subject-headings, as having been drawn up independently of each other and for different purposes. It is true, nevertheless, that there does exist an underlying connection between the two sets of terms, based upon the fact that their ultimate purpose is really the same; namely, to cover completely any field treated through terms expressive of its subject-matter; the one, through a systematic arrangement of topics which is based, in general, on the principles of co-ordination for subjects of equal rank or of the same stage of subdivision, and of subordination for the more specific topics included in the more general; the other, an alphabetical set of terms which also covers the field completely but which lends itself to the production of a uniform and consistent alphabetical arrangement of major and minor subjects. Into this underlying relationship we need, at the present time, go no further.

In seeking the definite subject-heading which we have specified must be equivalent to one class-symbol, we find that the

following five types of subject-headings¹ are commonly used in dictionary catalogs:

Types of Subject Headings

Type 1.

The specific subject-heading.—This means that heading which is definite and discrete in nature and equivalent to but one undivided symbol or to but one group of consecutive symbols in the system of classification. In the list of subject-headings no *see also* references have been made from this heading to subordinate divisions of the subject under the same number or numbers. Such a heading, according to library practice, is considered to be a topic which need not be divided further into its parts, either in the system of classification or in the subject-list. Such a heading is, therefore, the simplest element with which to work.

Examples:

	LC	DC
Emigrés	DC157	No number
Rainbow	QC976.R2	" "
Guild socialism	HD6479	" "
Trust companies	HG4301-44	332.14
Amphipoda	QL444.A5	595.371

Type 2.

The separating specific subject-heading.—This means that heading which is definite and discrete in nature and which is grouped with other specific or more general subjects under one symbol or one group of consecutive symbols. In this case, titles on the specific subject in question may be said to be separated out from the other subjects under the same symbol and grouped under the subject-heading in the catalog.

¹ Illustrations are taken from the Library of Congress system with Decimal Classification numbers added where available.

Examples:

	LC	DC
Quantum theory	QC6 (Under this number are grouped also other topics in Theoretical Physics)	530.1 (Theoretical Physics)
Butterflies	QL541-562 (Moths also included)	595.789
Fixed ideas ...	RC602 (Called General special, includes other subjects)	No number

Type 3.

The collecting specific subject-heading.—This means that heading which is definite and discrete in nature, and is equivalent to two or more scattered symbols or groups of consecutive symbols, and from which no references have been made in the subject-list to smaller divisions of the subject under the same number or numbers. Titles under these scattered symbols will be collected under the subject in the catalog.

Examples:

	LC	DC
Phosphorescence	QH641	591.59 (with others)
	QC478	612.772
Oleomargarine	SF268	614.326
	HD9441	664.3 (with others)
Cider	HD9398	663.1 (with others)
	TP563	

Type 4.

The collecting separating specific subject-heading.—As the name indicates, this heading combines the characteristics of Types 2 and 3, namely, a subject which is grouped with other topics under two or more symbols of classification. Titles on the specific subject are then separated from other subjects and are collected under the subject-heading in the catalog.

Examples:

	LC	DC
Chance ..	QA273 (Probabilities) ..	214 (Natural theology)
	BD595 (Cosmology) ...	519 (Probabilities)
	BC141 (Logic of chance. Probabilities)	122 (Metaphysics)
Truth ...	BT50 (Criterion of truth)	177.3 (Ethics)
	BC171 (Logic. Truth and error)	
	BD150-171 (Theory of knowledge)	

Type 5.

The general inclusive subject-heading.—This heading, which covers a series of symbols of composite nature in the system of classification, and which, both in the list of subject-headings and in the system of classification, is divided into two or more subordinate subjects, each of which may again be divided into subordinate subjects, until a subject is reached which will be specific in nature; that is, it will be divided no further, and thus equals Type 1, the *specific subject-heading*.

Examples:

	LC	DC
Meteorology	QC881-999 ..	551.5
Meteorological optics..	QC975-6 ...	no number
Rainbow	QC976.R2 ..	" "
Social psychology	HM251-291 .	301
Public opinion	HM261	no number
Arthropoda	QL434-597 ..	595.2--Arthropoda
Crustacea	QL435-445 ..	595.3---Crustacea
Amphipoda	QL444.A5 ..	595.36---Malacostraca
		595.37----Arthrostraca
		595.371---Amphipoda

Procedure

Seventy specific subject-headings, conforming in so far as possible to Type 1, were chosen for study in two large libraries which use the Library of Congress system of classification. Since

these same headings did not prove to be specific in the Decimal system, fifty-four different headings of the same type were chosen for study in two large libraries which used the latter system. The four libraries maintain complete dictionary catalogs.

The first two libraries made few, if any, modifications or additions in the Library of Congress scheme. In two or three cases only, among the 70 headings, were subjects found to have been subdivided.

The records of the two libraries using the Decimal system could not be depended upon to the same extent, and were therefore less satisfactory in illustrating our points. There were several reasons for this: both libraries, though with large collections of books, rarely carried the classification beyond one or two decimal points; both, also, had made many changes and additions of their own in the system which tended to confuse the classification and added to the difficulty of finding the type of subject sought.

Many of the subjects among the two sets of 54² do not, therefore, conform strictly to the criteria for the specific subject-heading; many of the class-numbers included more than the one subject. While this would affect the actual consultation of the books on the shelves by mixing the material sought with other subjects, it does not affect, in the same way, the results of our calculations. These will tend to indicate, in general, how material on the same subject, brought together in the subject-catalog, may be classed under various numbers and thus be widely separated on the shelves.

The subject-headings chosen have been compared with the cards standing under these headings in the dictionary catalogs of the respective libraries. Information thus derived is grouped in Tables X to XIII under the following divisions:

Column

1. The specific subject-heading.
2. Its specific class-number.

² The 54 headings for these two libraries were not identical, since their choice depended upon the holdings of each library.

3. Number of titles shelved under the class-number, including over-sized books which might be standing nearby on a lower shelf.
4. Number of analytical entries found under subject.
5. Number of titles, other than analyticals, found under subject, but not shelved under its class-number. (These cover cases where the specific subject is an additional or secondary part or aspect of the book, whose main shelving has been determined by another part or by the primary aspect of the book. Here are included, also, titles for books which have been taken out of the main order of books on the shelves and are shelved permanently in special collections; for example, in a Rare Book Room.)
6. Total number of titles under subject in catalog:
3 plus 4 plus 5
7. Percentage of titles under class-number:
3 divided by 6
8. Percentage of titles which are analyticals:
4 divided by 6
9. Percentage of titles with other shelving:
5 divided by 6

No account has been taken of books which were in circulation or temporarily removed from the shelves for binding or for other reasons when the investigation was being made. Many patrons of university and other libraries who use the books directly consider that this removal of books from the shelves constitutes the most serious drawback there is to a satisfactory and dependable use of any classified arrangement of books. In large public, reference, and special libraries whose shelves are open to a great number of readers, the same drawback would be felt; where access-to-shelves is restricted or prohibited entirely the inconvenience would be much less evident. This emphasizes once again that the chief value of classification lies in the direct use that can be made of the resulting arrangement of books on the shelves.

However, since our present purpose is to explain the way in which the techniques of classification and subject-cataloging work, regardless of any immediate or concrete situation, it has been thought best to ignore the effects of circulation of books, of removal for binding purposes, and so forth. These factors,

nevertheless, should always be kept in mind as being an additional detriment, when evaluating the use of books at the shelves as expressed in the results of the present study.

The immediate object is to arrive at the average percentage of titles on a specific subject which one can expect to find in one place on the shelves, in proportion to the total number of titles in the catalog under the same subject-heading. From the data compiled, we have, in the same way, calculated the average percentages of analytical entries and of titles on the subject not shelved under the class-number.

Two bases upon which to obtain these results are possible. In the first instance, we total in Tables X to XIII the actual number of titles found under the three groups (columns 3, 4, 5), and figure the percentage of each to the total of all titles. In the second, we total the percentages found for each group of titles under each subject-heading (columns 7, 8, 9), and figure the percentages of each to the total of all percentages. Both procedures will be used since both will clarify the nature of the use of subject-matter made possible through classification and subject-cataloging.

It should be kept in mind, of course, that neither method succeeds in taking into full account the differences which are due to the nature of the subjects themselves. It will not be possible to ascertain that use which is dependent upon the social values and characteristics of the subjects themselves, nor upon the purposes lying back of the search for material. One might ask, for instance, what is the relative importance of the reasons for seeking material, judged in the light of the status and purpose of the seeker and of the social importance and value of the object for which the material is sought. In other words, there may be a great deal of casual and ineffective running-over of cards in the catalog or of books on the shelves by readers with superficial interest, which leads to nothing, while other use

might lead to distinctly worthwhile ends. With an answer to this query we are not concerned at the present time.

Under the first procedure it is to be observed that each single title found under the 70 (or 54) subject-headings is a unit of value equal to every other title. Thus the 130 titles under Speculation³ would be 26 times the weight of the 5 titles under Relief maps; it would be assumed that the amount of use would be based upon quantity and that the bulkier group would be used 26 times the less bulky. In the same way, Americanization with 67 titles would be two and one-third times the weight of the 28 titles under Illiteracy.

Under the second procedure each of the 70 (or 54) examples of subjects are units of equal weight, regardless of the number of titles under each subject which stand in the dictionary catalog. Thus the 5 titles under Relief maps would be a unit of weight equal to the 130 titles under the subject Speculation; and Americanization with 67 titles would equal Illiteracy with 28 titles. The final result will rest upon the assumption that all subjects, though represented by differing totals of titles, are of equal value.

Repeating briefly: in the first instance, Speculation, Relief maps, Americanization, and Illiteracy, all vary in weight according to the number of titles under each; in the second instance, the subjects are all of equal weight as units of calculation, regardless of the number of titles under each.

In passing, it is interesting to note that the nature or type of the subject has a bearing upon the quantity, kind, and physical form of material published; and hence affects the number of titles appearing under the three groups (columns 3, 4, 5).

The subject may be one upon which a great deal is constantly being written, perhaps in a semi-popular or superficial vein, which will, for various reasons, become out-of-date very

³ Illustrations are chosen from the subject-headings used in Table X.

quickly. Is it likely that the average reader would care very much about consulting books on Speculation before, let us say, 1925? Might not the large number of books on Americanization be explained from the fact that at one time they were in great demand by foreigners and by teachers of the foreign-born, an interest which has now subsided with the changing immigration laws? In cases such as these the quantity of titles is not of primary importance, since those which are up-to-date outweigh, and, in many cases, supersede the older ones.

When the whole number of titles is small, or where few have been given the specific class-number, it may be that such subjects do not require nor lend themselves to voluminous writing, nor to the production of many books devoted to those subjects alone. Topics such as Relief maps with 5 titles, 2 only under specific class-number; Collembola with 8, 2 under class-number; Daylight-saving with 7, 3 under class-number; Sponges with 39, 5 under class-number, may be summed-up once and for a long time in a few books from information derived, in many cases, from extensive journal material. Thus each book has a definite and relatively permanent value. In cases such as these, the lack of bulkiness in number of titles, and especially in those shelved under specific class-numbers, should not usually be considered as lessening the value of the total material.

It may be observed that, in general, this summing-up of material, scattered in journals, might be carried on more thoroughly and therefore less frequently in the case of purely scientific books than, for instance, of books relating to certain of the social sciences where the subject-matter seems to have reached a lesser degree of stability and continues to require, therefore, an even greater amount of theoretical discussion.

From observations such as these, we may conclude that the type of subject has a bearing not only upon the quantity and kind of books appearing on that subject, but also upon the physical form in which published material appears: whether in

single volumes limited to the subject, in periodical or in other analytical form, or in volumes along with other subjects.

An examination of the entries comprising Tables X to XIII, and of the results of our calculations indicates a relationship among the titles under a subject. Entries under one topic cannot be considered independent of each other but form an integrated pattern resulting from the subject itself. The nature of a topic is such that entries tend to be distributed, according to a pattern, into the three classes, viz., the single volume with the specific class-number, the analytical article with the class-number taken from the main serial, and the volume shelved with another subject where the topic in question assumes secondary importance. There is thus produced what may be called a topic distribution, that is, a distribution resulting from the nature of the subject itself.

It is clear that we cannot arrive at any unimpeachable basis for weighting the different accumulations of subject-material, even though differences do exist. We have made use of the most tangible element of difference, that of quantity, expressed first, in number of title-entries under each heading; and second, in the subjects themselves, divided into percentages according to the distribution of titles appearing under them.

Under the first method we total, in Tables X to XIII, columns 3, 4, 5, 6; divide the total of column 3 by the total of column 6 and record the percentage in column 3. Similarly, compute the percentages for columns 4 and 5 and record in columns 4 and 5.

Under the second method we total, in Tables X to XIII, columns 7, 8, 9, which are the entries of columns 3, 4, 5, expressed as percentages for each subject-heading, and divide each sum by 70 (or 54) which is the number of subjects investigated. This gives percentages which are then recorded in columns 7, 8, 9.

Tables for the four libraries follow.

TABLE I

FREQUENCY OF CITATION OF SUBJECT IN THE DICTIONARY
CATALOG OF THE UNIVERSITY OF CHICAGO LIBRARY

Specific Subject Heading	Spe- cific Class No.	Entries under Subject in Dictionary Catalog				Percentages		
		With Class No.	Ana- lyti- cals	Other Shelv- ing	To- tal 3 4 5	Col. 3 %	Col. 4 %	Col. 5 %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Americanization.	JK1758	19	8	40	67	28	12	60
Average, (Mari- time Law).....	HE970	2	..	1	3	67	..	33
Behaviorism.....	BF199	9	..	27	36	25	..	75
Bull Run, 1st battle, '61....	E481	2	..	2	4	50	..	50
Capital punish- ment.....	HV8694- 99	30	6	17	53	56	11	33
Chickamauga, battle, '63....	E481.C5	5	4	1	10	50	40	10
Colombola.....	QL503.C6	2	6	..	8	25	75	..
Copper industry and trade.....	HD9539 .C5-7	11	2	4	17	65	12	23
Cormorant.....	QL696.S6	1	2	..	3	33	67	..
Crawford's Indi- an campaign....	E238	2	2	1	5	40	40	20
Daylight saving.	HM49.D3	3	4	..	7	43	57	..
Eagles.....	QL696.A2	..	4	..	4	..	100	..
Elephants.....	QL737.U5	2	4	2	8	25	50	25
Emigrés.....	DC157	2	4	9	15	13	27	60
Fasting.....	RM226-8	2	2	9	13	15	15	70
Faults (Geology)	QE606	..	4	2	6	..	67	33
Ferns, Fossil..	QE961	2	6	3	11	18	53	27
Firedamp.....	TN305	0	5	0	5	..	100	..
Fire-making.....	CN416-7	..	8	..	..	..	100	..
Fireflies.....	QL596.M2	1	1	1	3	33	33	34
Fireless cookers	TX831	1	1	1	3	33	34	33
Fireworks.....	TP300-1	1	1	1	3	34	33	33
First aid in illness.....	RC87	17	7	28	52	33	13	54
Fleas.....	QL503.A7	..	9	1	10	..	90	10
Flies as carriers of contagion....	RC117.F6	4	12	4	20	20	60	20
Fog.....	QC929.F7	1	5	2	8	12	62	26
Folds (Geology).	QE606	2	..	4	6	33	..	67
Galls (Botany)..	SB767	10	8	3	21	48	38	14
Geology, Strat. Eocene.....	QE692	1	9	..	10	10	90	..

DISTRIBUTION OF SUBJECTS

113

TABLE X - Continued

Specific Subject Heading	Spe- cific Class No.	Entries under Subject in Dictionary Catalog				Percentages		
		With Class No.	Ana- lyti- cals	Other Shelv- ing	To- tal 3 4 5	Col. 3 %	Col. 4 %	Col. 5 %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Geology, Strat.								
Miocene.....	QE694	1	4	..	5	20	80	..
Geology, Strat.								
Paleozoic.....	QE654	4	15	9	28	14	53	33
Guild socialism..	HD6497	11	..	11	22	50	..	50
Happiness.....	BJ1480-6	11	2	17	30	36	6	58
Hastings, Battle, 1066.....	DA196	..	..	2	2	..	..	100
Humanism.....	B778	10	8	75	93	11	9	80
Illiteracy.....	LC149-60	13	8	7	28	46	29	25
Insomnia.....	RC406	3	..	2	5	60	..	40
Jade.....	QE391.J	3	3	1	7	43	43	14
Jamestown Exposi- tion, 1907.....	T648	2	4	1	7	29	57	14
Jefferson, Thos..	E332	32	12	40	84	38	14	48
Landslides.....	QE599	1	7	1	9	11	78	11
Mercantile System	HB91	12	2	23	37	32	5	63
Moraines.....	QE578	2	6	2	10	20	60	20
Moratorium.....	JX5271.M6	1	3	6	10	10	30	60
Mosses.....	QE534-49	58	28	12	98	59	28	13
Mountaineering..	G505-510	4	3	19	26	15	11	74
Navaho Indians...	E99.M3	5	10	4	19	26	53	21
Olive.....	SB367	6	10	..	16	38	62	..
Public opinion....	HM261	13	4	32	49	27	8	65
Recidivists.....	HV6049	3	1	1	5	60	20	20
Recognition (Psy- chology).....	BF378.R4	3	2	2	7	29	29	52
Redwoods.....	SD397.R3	..	5	..	5	..	100	..
Referendum.....	JF491-7	34	25	23	83	40	31	29
Regicides.....	HV6278	1	1	5	7	14	14	72
Relief maps.....	GA140	2	2	1	5	40	40	20
Salads.....	TX807	2	..	2	4	50	..	50
Salvage.....	HE971	1	3	3	7	14	43	43
Satellites.....	QB401-7	8	14	15	37	22	38	40
Saving and Thrift	HG792033	24	12	25	61	40	19	41
Speculation.....	HG6001-51	46	10	74	130	35	8	57
Sponges.....	QL371-4	5	24	10	39	13	61	26
Strawberries.....	SB385	6	15	4	25	24	62	14
Suicide.....	HV6543-8	31	5	13	49	63	10	27
Taxation, State (collective)....	HJ2385	1	5	11	17	6	30	64
Teaching, Freedom	LB2332	7	1	9	17	41	6	53
Theaters, Stage setting.....	FN209LS8	10	4	17	31	32	13	55

TABLE X - Continued

Specific Subject Heading	Spe- cific Class No.	Entries under Subject in Dictionary Catalog				Percentages		
		With Class No.	Ana- lyti- cals	Other Shelv- ing	To- tal 3 4 5	Col. 3 %	Col. 4 %	Col. 5 %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trust Companies..	HG4301-44	14	4	19	37	38	11	51
Vicksburg-Siege..	E481.V6	5	..	5	10	50	..	50
Waterloo, 1815...	DC241-4	12	1	10	23	52	4	44
Youth.....	HQ796-9	8	5	20	33	24	15	61
Total.....		547	393	969	1636	2081	2461	2458
<u>First Method</u>								
Totals of columns 3, 4, 5 as per- centages.....	...	33.4*	24.0*	42.5*				
<u>Second Method</u>								
Totals of columns 7, 8, 9 as per- centages.....	...	..	..	..	..	29.7	35.2	351
Probable error of percentage of column 7.....	...	..	..	..	..	1.4	**	**

*The P.E.'s of 33.4 per cent, 24.0 per cent and 42.5 per cent are unknown, but undoubtedly less than 1.4, because the P.E. of a proportion based on a weighted average (weighted according to number of entries under each subject) should be considerably less than the P. E. based upon an unweighted average which has been found to be 1.4 for the percentage 29.7 per cent.

**P.E. not calculated, but of the order of 1.4.

TABLE XI

FREQUENCY OF CITATION OF SUBJECTS IN THE DICTIONARY
CATALOG OF THE LIBRARY OF CONGRESS

Specific Subject Heading	Spe- cific Class No.	Entries under Subject in Dictionary Catalog				Percentages		
		With Class No.	Ana- lyti- cals	Other Shelv- ing	To- tal 3 4 5	Col. 3 %	Col. 4 %	Col. 5 %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Americanization..	JKL758	47	6	93	146	32	4	64
Average (Maritime law).....	HE970	12	..	27	39	31	..	69
Behaviorism.....	RF199	22	..	23	45	49	..	51
Bull Run, 1st battle '61.....	E472.18	26	6	10	42	62	24	14
Capital punish- ment.....	HV9694- 99	121	5	48	174	70	3	27
Chickamauga, Battle, 1864....	E475.81	28	5	5	38	74	13	13
Collembola.....	QL503.06	6	7	..	13	46	54	..
Copper industry and trade.....	HD9539 .C5-7	7	..	10	17	41	..	59
Cormorant.....	QL696.S6	1	2	1	4	25	50	25
Crawford's Indian campaign.....	E238	2	2	2	6	33	33	34
Daylight-Saving..	HN49.D3	16	..	1	17	94	..	6
Eagles.....	QL696 .A2	6	4	2	12	50	34	16
Elephants.....	QL737 .U5	1	5	23	29	3	17	80
Emigrés.....	DC158	21	2	19	42	50	5	45
Fasting.....	RM226-8	18	5	16	39	46	13	41
Faults (Geology).	QE606	3	3	2	8	37	38	25
Ferns, (Fossil)..	QE961	1	3	..	4	25	75	..
Fire-damp.....	TN305	9	6	1	16	56	37	7
Fire-making.....	GN416-7	2	5	2	9	22	56	22
Fireflies.....	QL596 .M2	2	1	2	5	40	20	40
Fireless cookers.	TX831	8	..	3	11	73	..	27
Fireworks.....	TP300-1	18	1	12	31	58	3	39
First aid in illness.....	RC87	111	15	84	210	52	7	41
Fleas.....	QL503 .A7	6	3	7	16	37	19	44
Flies as carriers of contagion....	RC117.F6	21	6	13	40	53	15	32

TABLE XI - Continued

Specific Subject Heading	Spe- cific Class No.	Entries under Subject in Dictionary Catalog				Percentages		
		With Class No.	Ana- lyti- cals	Other Shelv- ing	To- tal 3 4 5	Col. 3 %	Col. 4 %	Col. 5 %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fog.....	QC929.F7	7	3	10	20	35	15	50
Folds (Geology)...	QE606	2	1	2	5	40	20	40
Galls (Botany)...	SB767	9	5	7	21	43	23	34
Geology, Strat.								
Eocene.....	QE692	1	4	1	6	17	66	17
Geology, Strat.								
Miocene.....	QE694	3	1	1	5	60	20	20
Geology, Strat.								
Paleozoic.....	QE654	7	9	6	22	32	41	27
Guild socialism..	HD6479	13	..	24	37	35	..	65
Happiness.....	BJ1480- 86	108	2	37	147	73	2	25
Hastings, Battle, 1066.....	DA196	..	2	2	4	..	50	50
Humanism.....	B821	10	1	12	23	43	4	53
Illiteracy.....	LC149-60	39	7	12	58	67	12	21
Insomnia.....	RC406	10	..	7	17	59	..	41
Jade.....	QE391.J2	2	2	16	20	10	10	80
Jamestown Exposi- tion, 1907.....	T648	24	1	26	51	47	2	51
Jefferson, Thos..	E332	91	26	123	240	38	11	51
Landslides.....	QE599	4	8	1	13	31	61	8
Moraines.....	QE578	2	2	1	5	40	40	20
Moratorium.....	JK5271							
..M6		2	..	44	45	4	..	96
Mosses.....	QK534-49	84	31	9	124	68	25	7
Mountaineering...	G505-10	37	2	174	213	17	1	82
Navaho Indians...	E99.N3	23	14	22	59	39	24	37
Olive.....	SB367	20	9	5	34	59	26	15
Public opinion...	HM261	19	6	59	84	23	7	70
Recidivists.....	HV6049	5	..	13	18	28	..	72
Recognition (Psy- chology).....	BF378.R4	1	4	3	8	13	50	57
Redwoods.....	SD397.R3	3	1	6	10	30	10	60
Referendum.....	JF491-7	99	7	58	164	60	4	36
Regioides.....	HV6278	1	1	15	17	6	6	88
Relief maps.....	CA140	6	1	4	11	56	9	35
Salads.....	TX807	37	1	6	44	84	2	14
Salvage.....	HE971	2	3	34	39	5	8	87
Satellites.....	QB401-8	22	16	11	49	45	32	23
Saving and thrift.	HG7920- 33	96	5	72	173	55	3	42

TABLE XI - Continued

Specific Subject Heading	Spe- cific Class No.	Entries under Subject in Dictionary Catalog				Percentages		
		With Class No.	Ana- lyti- cals	Other Shelv- ing	To- tal 3 4 5	Col. 3 %	Col. 4 %	Col. 5 %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Speculation.....	HG6001-51	178	7	139	324	55	2	43
Sponges.....	QL371-4	33	19	19	71	46	27	27
Strawberries.....	SB385	24	6	7	37	65	16	19
Suicide.....	HV6543-48	55	5	23	83	66	6	28
Taxation (State) Collective.....	HJ2385	5	6	27	38	13	16	71
Teaching, Freedom of.....	LB3223	7	1	12	20	35	5	60
Theaters, Stage setting.....	PN2091 .88	29	2	37	68	42	3	55
Trust companies..	HG4301-48	36	7	63	106	34	7	59
Vicksburg-Siege..	E475.27 .V6	24	6	11	41	59	15	26
Waterloo, 1815...	DC241-4	25	1	9	35	71	3	26
Youth.....	HQ796-9	19	1	48	68	28	2	70
Total.....		1747	329	1652	3728	2956	1209	2835
<u>First Method</u>								
Totals of columns 3, 4, 5 as per- centages.....	..	46.8	8.8	44.0	..	..	..	..
<u>Second Method</u>								
Totals of columns 7, 8, 9 as per- centages.....	..	...		..	..	42.2	17.3	40.5

TABLE XII

FREQUENCY OF CITATION OF SUBJECTS IN THE DICTIONARY
CATALOG OF THE MASSACHUSETTS STATE LIBRARY*

Specific Subject Heading	Spe- cific Class No.	Entries under Subject in Dictionary Catalog				Percentages		
		With Class No.	Ana- lyti- cals	Other Shelv- ing	To- tal 3 4 5	Col. 3 %	Col. 4 %	Col. 5 %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Agricultural cred- it.....	332.311	26	41	10	77	34	53	13
Architecture, Gothic.....	723.5	2	..	8	10	20	..	80
Beaver.....	599.32	1	8	..	9	11	89	..
Birth control.....	613.94	5	2	1	8	63	25	12
Births and birth- rate.....	614.11	4	5	5	14	28	36	36
Bismark.....	B	15	11	9	35	43	31	26
Bison, American...	599.7	1	3	2	6	17	50	33
Butterflies.....	595.789	14	6	5	25	56	24	20
Cactaceae.....	583.471	..	4	10	14	..	28	72
Children-Employ- ment.....	331.3	90	141	32	263	35	54	11
Clearing-house....	332.78	16	7	2	25	64	27	8
Cliff dwellings...	571.84	..	9	..	9	..	100	..
Communism.....	335.4	10	14	18	42	24	33	43
Coral reefs.....	551.96	1	5	3	9	11	55	34
Ferns.....	587.3	4	12	2	18	22	67	11
Flies as carriers of contagion....	614.43	3	1	2	6	50	17	33
Freedom.....	326.8	10	2	4	16	63	12	25
Freedom of seas...	341.3	4	5	1	10	40	50	10
Friendly societies	334.7	14	16	12	42	33	38	29
Frogs.....	597.8	..	3	1	4	..	75	25
Geology, Strat. Devonian.....	551.74	1	13	..	14	7	93	..
Geology, Strat. Silurian.....	551.73	1	4	..	5	20	80	..
Illiteracy.....	379.2	17	5	6	28	61	18	21
Insurance, Fire...	368.1	40	26	17	83	48	31	21
Insurance, Marine.	368.2	6	8	2	16	37	50	13
Jefferson, Thos. . B	33	43	20	96	34	45	21	..
Kitchen-middens...	571.93	..	18	..	18	..	100	..

*The class-numbers given in this table are those found in the twelfth edition of the Decimal Classification. These vary in several cases from those used by the Massachusetts State Library.

DISTRIBUTION OF SUBJECTS

119

TABLE XII -- Continued

Specific Subject Heading	Specific Class No.	Entries under Subject in Dictionary Catalog				Percentages		
		With Class No.	Analyticals	Other Shelving	Total 3 4,5	Col. 3 %	Col. 4 %	Col. 5 %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Lake dwellers and dwellings.....	571.83	..	4	..	4	..	100	..
Meteorites.....	523.51	..	14	..	14	..	100	..
Microscope and microscopy.....	578	3	4	..	7	43	57	..
Mites.....	595.42	..	8	..	8	..	100	..
Mosses.....	588.2	1	5	1	7	14	72	14
Mounds & m. bldrs.	571.913	2	112	12	126	2	89	9
Moving-pictures...	791.4	45	57	10	112	41	51	8
Parliamentary practice.....	328.1	77	5	13	95	81	5	14
Physiognomy.....	138	2	..	2	4	50	..	50
Profit-sharing....	321.24	17	16	8	41	41	39	20
Prohibition.....	178.5	26	15	16	57	46	26	28
Project method in education.....	371.36	4	10	2	16	25	62	13
Proportional reph.	324.224	4	10	2	16	25	62	13
Realism.....	149.2	..	4	..	4	..	100	..
Referendum.....	328.264	28	22	26	76	37	29	34
Saving and thrift.	331.84	3	8	22	33	9	24	67
Speculation.....	332.64	22	9	7	38	58	24	18
Spies.....	341.3	4	1	1	6	67	16	17
Spiritualism.....	134	2	1	3	6	33	17	50
Species, Origin of	575.8	3	7	1	11	27	64	9
Syndicalism.....	331.88-62	11	6	12	29	38	21	41
Suicide.....	179.7	1	4	2	7	14	57	28
Trust companies...	332.14	9	17	16	42	22	40	38
Utilitarianism....	171.5	3	1	5	9	33	11	56
Volcanoes.....	551.21	11	17	2	30	36	57	7
Voting, Absent....	324.247	2	6	3	11	18	55	27
Waterloo, Battle of, 1815.....	944.05	2	2	..	4	50	50	..
Total.....	...	600	777	338	1715	1631	2610	1159
<u>First Method</u>								
Totals of columns 3, 4, 5, as %	...	34.9	45.3	19.8	..	..	..	..
<u>Second Method</u>								
Totals of columns 7, 8, 9, as %	...	...	...	...	..	30.2	48.3	21.5

TABLE XIII

FREQUENCY OF CITATION OF SUBJECT IN THE DICTIONARY
CATALOG OF NORTHWESTERN UNIVERSITY LIBRARY*

Specific Subject Heading	Spe- cific Class No.	Entries under Subject in Dictionary Catalog				Percentages		
		With Class No.	Ana- lyti- cals	Other Shelv- ing	To- tal 3 4 5	Col. 3 %	Col. 4 %	Col. 5 %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Agnosticism.....	211	6	3	5	14	43	22	35
Agricultural cred- it.....	332.31	10	4	17	31	32	13	55
Architecture, Gothic.....	723.5	6	3	5	14	43	22	35
Argon.....	546.293	..	4	2	6	..	66	34
Art, Baroque.....	724.19	..	..	3	3	..	..	100
Butterflies.....	595.789	4	10	1	15	27	66	7
Cactaceae.....	583.471	5	6	1	12	40	50	10
Cave fauna.....	591.9	..	2	4	6	..	34	66
Children-Employ- ment.....	331.3	16	39	28	83	19	46	35
Cirrepedia.....	595.35	..	..	6	6	..	..	100
Cliff dwellings..	571.84	..	3	2	5	..	60	40
Communism.....	335.4	3	2	8	13	23	15	62
Coral reefs.....	551.96	2	7	..	9	22	78	..
Cycadaceae.....	585.9	2	1	..	3	66	34	..
Faults (Geology)..	551.87	1	3	1	5	20	60	20
Ferns.....	587.3	15	12	6	33	45	36	19
Folds (Geology)..	551.87	2	..	2	4	50	..	50
Friendly societies	334.7	2	3	6	11	18	28	54
Frogs.....	597.8	3	9	6	18	17	50	33
Illiteracy.....	379.2	3	4	1	8	38	50	12
Income tax.....	336.24	26	8	44	78	33	10	57
Instrumentation..	781.631	6	..	5	11	56	..	44
Insurance, Fire..	368.1	10	7	19	36	28	19	53
Insurance, Marine	368.2	4	..	15	19	21	..	79
Kitchen-middens..	571.93	..	20	..	20	..	100	..
Labor turnover...	331.126	3	3	1	7	43	43	14
Laissez faire....	330.153	1	1	3	5	20	20	60
Lake dwellings...	371.83	..	4	1	5	..	80	20
Least squares....	519.8	4	1	7	12	34	8	58
Mercantile system	330.151	..	..	7	7	..	..	100
Meteorites.....	552.6	3	17	55	75	4	23	73
Middle classes...	323.32	1	..	4	5	20	..	80
Mites.....	595.42	..	6	..	6	..	100	..
Mosses.....	588.2	8	15	1	24	34	63	3
Mountaineering...	796.52	1	..	4	5	20	..	80
Mound builders...	571.913	5	7	1	13	38	54	8

DISTRIBUTION OF SUBJECTS

121

TABLE XIII -- Continued

Specific Subject Heading	Spe- cific Class No.	Entries under Subject in Dictionary Catalog				Percentages		
		With Class No.	Ana- lyti- cals	Other Shelv- ing	To- tal 3 4 5	Col. 3 %	Col. 4 %	Col. 5 %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Moving-pictures..	808.21	19	9	9	37	52	24	24
Parliamentary practice.....	328.1	11	3	7	21	53	14	33
Parsees.....	295	2	3	..	5	40	60	..
Parthenogenesis (Zoology).....	591.162	2	1	4	7	28	14	58
Physiocrats.....	330.152	1	1	3	5	20	20	60
Profit-sharing...	331.24	6	4	9	19	32	21	47
Prohibited books.	098.1	1	3	8	12	8	26	66
Prohibition.....	178.5	17	7	21	45	38	16	46
Project method in education.....	371.36	10	6	10	26	38	24	38
Realism.....	149.2	10	7	13	30	33	23	44
Rosicrucians.....	366.4	1	2	1	4	25	50	25
Strikes and lock- outs.....	331.89	13	9	15	37	35	24	41
Syndicalism.....	331.88	6	4	13	23	26	17	57
Species, Origin of.....	575.8	4	6	4	14	29	42	29
Sponges.....	593.4	1	9	1	11	9	82	9
Trust companies..	332.14	9	7	10	26	35	27	38
Utilitarianism...	171.5	2	3	7	12	17	25	58
Volcanoes.....	551.21	11	21	2	34	32	62	6
Total.....	...	278	309	408	995	1404	1821	2175
<u>First Method</u>								
Totals of columns 3, 4, 5, as per- centages.....	...	27.9	31.0	41.0	...	...	...	...
<u>Second Method</u>								
Totals of columns 7, 8, 9, as per- centages.....	...	...	...	...	...	26.0	33.7	40.2

*The class-numbers given in this table are those found in the twelfth edition of the Decimal Classification. They vary in several cases from those used in Northwestern University Library.

In Table X, the percentages obtained by the first method, where equal weight is given to each entry under subject, are 33.4 per cent, 24.0 per cent, and 42.5 per cent, as compared with the percentages obtained under the second method, of 29.7 per cent, 35.2 per cent, and 35.1 per cent, where the subject-headings expressed in percentages are considered of equal importance.

In Table XI,⁴ the first method gives 46.8 per cent, 8.8 per cent and 44.0 per cent; the second, 42.2 per cent, 17.3 per cent and 40.5 per cent.

In Table XII, the first method gives 34.9 per cent, 45.3 per cent and 19.8 per cent; the second, 30.2 per cent, 48.3 per cent and 21.5 per cent.

In Table XIII, the first method gives 27.9 per cent, 31.0 per cent and 41.0 per cent; the second, 26.0 per cent, 33.7 per cent and 40.2 per cent.

Table XIV is a comparison of the results of Tables X to XIII. The results of Table XIV show that, with one exception only, the differences in the size of percentages obtained by Methods 1 and 2 tend to vary in the same direction, under the three main columns representing (1) the Specific class-number, (2) Analyticals, (3) Other shelving. For example, in the first main column, 33.4 per cent, obtained under the first method for the University of Chicago Library, is greater than 29.7 per cent, obtained under the second method. This holds true for the results in the same column for the other libraries: 46.8 per cent is greater than 42.2 per cent, 34.9 per cent is greater than 30.2 per cent, 27.9 per cent is greater than 26 per cent.

⁴ The marked differences between Tables X and XI with respect to percentages for specific entries (33.4 per cent as against 46.8 per cent) and for analytical entries (24.0 per cent against 8.8 per cent) is explained by the writer as follows: The Library of Congress (Table XI) has more duplicate volumes than has the University of Chicago Library (Table X). In the case of duplicate volumes the call-number of the copy which is shelved separately appears usually at top left-hand corner of card, while the analytical call-number appears some space below. In checking the distribution of entries, the top number was taken and the one below was ignored.

In the second main column, Analyticals, a consistent tendency in variation holds true also, this time percentages under the first method being less than those under the second: 24.0 per cent is less than 35.2 per cent, 8.8 per cent is less than 17.3 per cent, 45.3 per cent is less than 48.3 per cent, 31.0 per cent is less than 33.7 per cent.

TABLE XIV
COMPARISON OF RESULTS OF TABLES X - XIII

Libraries	Percentages					
	1		2		3	
	Specific Class- Number		Analyticals		Other Shelving	
	Method		Method		Method	
	1 %	2 %	1 %	2 %	1 %	2 %
University of Chicago.	33.4	29.7	24.0	35.2	42.5	35.1
Library of Congress...	46.8	42.2	8.8	17.3	44.0	40.5
Massachusetts State Library.....	34.9	30.2	45.3	48.3	19.8	21.5
Northwestern University.....	27.9	26.0	31.0	33.7	41.0	40.2
Average for the four libraries.....	35.8	32.0	27.3	33.6	36.8	34.3

In the third main column, Other shelving, a consistent tendency in variation holds true, with the exception of the Massachusetts State Library. Percentages are, in three cases, greater under the first method than under the second method: 42.5 per cent is greater than 35.1 per cent, 44.0 per cent is greater than 40.5 per cent, 19.8 per cent is slightly less than 21.5 per cent, 41.0 per cent is greater than 40.2 per cent.

A few general interpretations of these results which bear indirectly upon the main conclusions which we are seeking may be in order. Holding in mind the fact that the first method, in giving equal weight to each title, weights the subject having many title entries, and that the second method, in giving equal weight to each subject as expressed in percentages of topic distribution, weights the subjects having a small number of entries, it appears from all this that the differences as found in the consistent tendencies for variation, though in some cases small, are probably significant.

Thus the 33.4 per cent which is greater than 29.7 per cent, and so on for the other entries in Column 1, indicates that the average proportion of books shelved under the Specific class-number is greater for topics having many entries than for topics having few entries.

Somewhat greater differences are found in the case of Analyticals and Other shelving under the two methods which, also, may have significance. Thus 24.0 per cent as against 35.2 per cent, and so on for the other entries in Column 2, indicates that there tend to be more analyticals for the less bulky subjects. Also, 42.5 per cent as against 35.1 per cent, the same tendency in variation holding true for two of the three remaining entries in Column 3, indicates that bulky subjects are treated somewhat more frequently than non-bulky subjects in works that are not shelved under the specific class-number.

The object of the foregoing tables has been to point out general tendencies of variation and not to obtain exact statistical results. The purpose which we have in mind is satisfied when we have made clear for several major libraries whose procedure is based upon modern library techniques, the approximate distribution of material on definite topics.

Primarily, we have sought to point out the amount of material on a specific subject which one can count upon finding on the shelves under its class-number, in proportion to the amount made available in the subject-catalog. Secondarily, we have also

shown the proportions shelved as analyticals and under class-numbers other than the specific.

Comparing, then, the final average percentages for the two methods under the three main columns, we have 35.8 per cent is greater than 32.0 per cent, 27.3 per cent is less than 33.6 per cent, 36.8 per cent is greater than 34.3 per cent. These three results can be expressed roughly as thirds of the whole amount which is found under the specific subject-heading in the subject-catalog. In other words, of all the material on a subject which is brought out under that subject in a well-made dictionary catalog, one-third is shelved under the subject's specific class-number, one third appears in the form of analytical entries shelved with the main series, and one-third is shelved elsewhere.

So much for distribution of entries in the subject-catalog. The results of both investigations emphasize the fact that consultation of the shelves under the arrangements of books produced by our present methods of classification furnishes, oftentimes, the merest starting-point in locating material on a given subject; these results also stress the important rôle which the subject-catalog plays in bringing together scattered material. This flexibility of the subject-catalog, in contrast to the unavoidable rigidity of classification, makes it the better medium for indicating the subject resources of a library.

CHAPTER VII

CONCLUSION

THE foregoing study which deals mainly with the classification of books for libraries has brought to light many factors which adversely affect the usefulness of closely classified arrangements of books on the shelves. These are of two kinds: those which are inherent in classification itself, and those which are due to limitations in its practical application to books. Considering the effects of all of these elements upon the order of books on the shelves, it becomes clear that present procedures in classification do not achieve the ends which librarians in general assume that they do.

A systematic arrangement of books according to their subject-matter seems to be the most helpful kind of order that can be devised for the greater number of fields which constitute our growing collections of books; but the application of any such system calls for a clear understanding of all that happens before, and even after, the books finally rest upon the shelves.

It becomes evident that the criteria for measuring the success of any effort at classification are to be found in the nature and extent of the use that can be made of the books when classified. To know that, on an average, three times as many titles on specific subjects can be traced under the subject in the dictionary catalog as can be found by direct consultation of the shelves; to know, further, that there is no assurance of finding the most important contributions under the number; to keep clearly in mind that the use of classified books is but one of many steps to be taken in searching for subjects—all of these facts tend immediately to diminish the reliance which one can place upon consultation of the shelves for finding desired material.

In building a system of classification care should be given to the determination of the major and fundamental fields of subject-matter and of the relationships of the more special subjects within these fields. The sorting-out of books into definite concrete groups of subjects should always be made possible and should prove useful where the divisions would tend to collect a fair proportion of the books on the subjects. But elaborate analysis of a field into theoretical, debatable, minor, or even greatly specialized topics, where very little material would ever be brought together on the shelves, is to be avoided. Topics which would thus tend to be isolated singly or in very small groups might better be recorded in other ways.

A wise simplification of classification is called for in order to produce an order of books less closely subdivided and thus less the product of a stated period of time. In this way, only, will the arrangements of books continue to be useful to future as well as to present library readers.

The present study has made it evident that the important needs of serious library readers can be met but partially through classification. Searching for material on specific subjects through direct consultation of the books on the shelves is an unreliable procedure. To rely upon classification alone is far less than a half-way measure. Since librarians consider it one of their highest duties to make possible for their readers an adequate subject-approach to books they are forced to turn to other records to help achieve this end.

One such record is the dictionary card-catalog which, through careful construction based upon a wise choice of subject-headings and cross-references, and a well-thought-out and consistent arrangement of cards, can be made to compensate for the weaknesses of classification and to supplement its service to a marked extent. The use of this more flexible kind of instrument makes possible the recording of subject-matter which otherwise would be totally lost. Through its steady strengthening, the burden upon classification, never adequately carried, can be lightened.

Yet even the ideal subject-catalog would be limited in the number and kind of entries it could include; it cannot begin to exhaust the possible sources of information on definite subjects, a fact which has been clearly shown in the first study. In addition to entries found in the catalog, there still remains the body of general and special indexes and bibliographies which must be utilized in each field. The best subject-catalog is one which yields information up to a certain point, accurately and completely, so that the scholar and specialist can feel assured that, so far, the way has been cleared in the search for material; and that, from then on, they can continue to seek by means of more detailed methods of research.

The present inquiry has been critical throughout but it has not meant to be destructive of the true and lasting values of classification. It has endeavored to clarify the actual extent to which the classification of books achieves its assumed end of aiding readers in their search for material in fields of subject-matter. Just as all activities within a library should derive their meaning from purposes which are considered to be socially valuable, so the classification of books can be said to be justified to the extent to which it strengthens and supplements other procedures in bringing the right books to those readers who are prepared to make good use of them.

Classification has here been presented, not as an end in itself based upon bewildering and involved mechanics of procedure, but rather as an expression of inherent and important relationships the utilization of which will constitute an indispensable means of arriving as directly as possible at a socially useful end. The need for the librarian's understanding of the structural organization of a functioning and growing body of knowledge has been implied throughout. The expression of this through a classification of books effectively serving both the psychological needs of the readers and those dependent upon the relationships of ideas in fields of subject-matter is the end sought.

The classification of books can be considered, moreover, more than simply a means for the arrangement of books on the shelves, more even than a way of bringing subject-matter to the readers. Its mastery by the intelligent librarian becomes a form of discipline which will awaken him to the profound significance of its close correlation with fructifying knowledge.

To conceive of all knowledge as comprised of ideas arranged in a kind of patterned unity not fixed but capable of varying designs, each idea or part of the pattern related to and correlated with every other part; to conceive also of the continuous growth of the whole even though the parts vary in vitality, some disappearing to make way for the fuller growth and expansion of others; then to conceive that the books within the library hold this knowledge which, in order to be carried on, developed, and made a part of the great stream of vital thought, must be brought into contact with living minds; if then, conceiving all this, the librarian assumes even a part of the responsibility of helping to bring readers and the ideas in books together, he will enter into a realm of service the value of which is now only faintly imagined.

In so far as this study has opened the way for a clearer understanding of these concepts and of their importance in improving the quality of library service, to that extent it has fulfilled its mission.

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APPENDIX

APPENDIX

CLASSIFICATION OF BOOKS AND SUBJECT-CATALOGING AS FIELDS FOR INVESTIGATION

CONTENTS

Introductory Survey of the Fields of Classification and Subject-Cataloging:
Their Purpose, Importance, and Results, in Terms of Use

PROBLEMS

- Group I: Classification and Subject-Cataloging in General
 - II: Subject-Cataloging
 - III: The Work of Classification
 - IV: Studies in Building Systems of Classification
 - V: The Dewey Decimal and the Brussels Systems
 - VI: The Library of Congress System
 - VII: The Dictionary Catalog: The Arrangement and Use of the Sections Devoted to Subjects
 - VIII: The Classified Catalog and Shelf-List
 - IX: Administrative Problems, including Cost of Cataloging and Classification
 - X: Reference Work in Relation to Classification and Subject-Cataloging
 - XI: Special Libraries
 - XII: Proposed Training for Librarians in Fields of Subject-Matter
 - XIII: Techniques for the Integration of the Subject-Matter in Books with the Practical Requirements of Library Service

INTRODUCTORY SURVEY

The general purpose and importance of the classification and subject-cataloging of books, considering such aspects as the following:

1. Their general aim, which is to make the subject-matter of books accessible to library readers.
2. Their immediate, practical importance, which lies in the fact that their results are everywhere in evidence, in the arrangements of books on library shelves and of cards in subject-catalogs. A mass of material is thus at hand for testing values, in terms of use.
3. These results are taken by many as a concrete indication of the librarian's idea of serviceable arrangements and recording of books. Do they, however, meet as fully with the approval of the one who uses the books? One professor has said: "A system of cataloging that separates . . . literature that should be massed together, sets of single purpose and material of the same character, is more than an annoyance—it is an actual hindrance."
4. The adjustment of these procedures to various types of libraries and to various groups of readers.
5. The fact that the younger men and women in the field of librarianship are turning away from cataloging and classification toward administrative interests. Yet as administrators they should be fully cognizant of and responsible for all practices which lead to a permanent organization of their collections. Moreover, since the field itself rewards those who enter, it is to be hoped that able men and women will turn to it.
6. Other.

PROBLEMS

GROUP I

Classification and Subject-Cataloging in General

1. How do the present methods of classification and subject-cataloging work? What are their results as measured in terms of the needs of research workers and other serious library patrons? To answer these questions, analyze the procedures and study the actual use made of their results. Consider the following:
 - a. Interview the readers of the library who make use of and who depend, more or less, upon the results of these procedures. Study their opinions and criticisms to determine whether these are due to a misconception of the nature of the work, or whether they are sound. If the latter, study ways of modifying or of re-emphasizing parts of library procedure in order to meet the readers' needs as brought to light through criticism.
 - b.¹ Analyze the following questions of the patron: "What proportion of titles on a specific subject is to be found on the shelves under its class-number, in comparison with the total number of titles appearing under the subject in the dictionary catalog?" And: "Why do I find so small a proportion of material on a specific subject under its symbol on the shelves, a somewhat greater amount under its heading in the catalog, but in both places together often only a small part of the total material which is known to be in the library?"

Suggestions for studying such questions:

- (1) Select a fair sampling of specific subjects and determine the average proportions of titles found on the shelves under class-numbers, under subjects in catalog, including analyticals and titles shelved under class-numbers other than the specific one.
- (2) The comparative function of shelf-classification, of the subject-catalog, and of bibliographies, in research. E.g., analyze bibliographies on specific subjects to show if and how the items are made available in library records.

¹ This problem has been investigated, in part, in the present volume.

2. Relationship between classification and subject-cataloging.
 - a. How does subject-cataloging supplement classification?
 - b. What is the relationship between subject-headings and the captions in various systems of classification? Consider the assumption that the classification scheme in its subdivisions takes no account of the alphabetical subject-headings, but that the problem of entering under a subject in the catalog is an entirely different one from that of classifying a book under the proper division. Can the terms interpreting the symbols be accepted as subject-headings? Choose examples where equivalences are to be found, and also cite various examples of types of variations.
3. What is the general attitude in European countries toward the subject-approach to books; that is, toward the systematic arrangement of books on the shelves, subject-catalogs in book or card form, subject-indexes and subject-headings? Investigate practices in Germany especially: for example, has the *Credo germanicum*, so-called by Fumagalli, become modified of late years?

Consult writings by Boysen, Diesch, Leyh, Ladewig, Shunke, Hanauer, and others.
4. Consider *Use* as a basis of classification and subject-cataloging. For what purpose has a book been written? What were the author's special qualifications, fields of interest, and experience? Who will use the book?

Classify a large group of books according to the use that will be made of them, rather than according to their intrinsic subject-matter. Then, find out through the readers who have actually used the books, the exact nature of the use made of them. Confer, if possible, with the authors themselves, as to purpose of books.

ADDITIONAL PROBLEMS

ADDITIONAL PROBLEMS

GROUP II

Subject-Cataloging

1. Study the metamorphosis or evolution of subject-headings.
E.g. The descriptive term, Country life, has now given way to the term, Rural Sociology, which not only denotes the study of rural phenomena from a descriptive point of view, but also gives consideration to theoretical and practical matters of rural social organization.
2. Analyze the act by the trained librarian of determining a subject heading:
 - a. By one who has no knowledge of the field in which the subject falls.
 - b. By one who has some special knowledge.
(Cf. X. 2)
3. Study the differences between subject-headings and subject-index entries. This is a fruitful field for comparison.

Theoretically, it can be said, index entries bear the same relationship to subject-headings as journal articles bear to books. Just as journal and other serial articles are frequently the substance out of which books are born, so the index entries to the former will furnish material for subject-headings for the latter. It is to be kept in mind that, in everyday work, the assignment of subject-headings is not confined to books, but frequently includes also the consideration of pamphlet material, and comparatively brief analytical material of all sorts.

4. Methods for deriving lists of subject-headings.
Study particular methods followed by librarians who have produced lists of subject-headings in special fields of subject-matter: for example, Maynard in Electrical engineering, Nichols in Financial subjects, Morley in Industrial relations, Voegelien in Education, Boggs and Lewis for Maps, Fenton in Insurance, Kelley in Sociology, Pettee in Theology.
5. Study the use of General information cards and cross-references, emphasizing their effect in reducing number of subject-entries; also determine the kinds which are suited to special fields of subject-matter. See, for example, Maynard, *Some Problems in Bibliography*.

6. Practical methods for keeping subject-headings up-to-date. Are there any short-cuts for keeping the headings reasonably modern in the dictionary catalog or can present procedures be simplified?
7. Bringing information into business (See XI, 7).
8. Determine types of authorities for subject-headings in special fields, suitable for library use.

Aside from lists of subject-headings already drawn up for library use, use text-books, treatises, surveys, histories of subjects, which have well-organized tables of contents and indexes.

9. Develop procedure for choosing new subject-headings, especially those not found in the ordinary lists.

Consider all forms and names covering subject. For example, keep a record of tentative subject-headings, or of catchword titles deferred for a time, which, taken together, may suggest possible future headings.

10. It has been said that scholars and specialists seldom, if ever, use the subject-sections of library catalogs. Shall we consider this as final, or shall we try to ascertain possible reasons for this statement?

Discuss such reasons as:

- a. Specialist does not understand the principles upon which the catalog is made.
- b. He has been disappointed many times in not finding what he was after, so has given up trying.
- c. He has found especially valuable or unique aspects of a book ignored, so has learned to look elsewhere.
- d. He thinks of the work of a definite author far oftener than of a subject.
- e. He never needs to approach a whole field to discover subject.
- f. He always needs to find a more specific point than is possible to be expressed in a subject-catalog.

ADDITIONAL PROBLEMS

ADDITIONAL PROBLEMS

GROUP III

Work of Classification

1. Analyze the act of classification in definite fields of subject-matter.
 - a. By one or more classifiers who have no knowledge of the field.
 - b. By one or more who have special knowledge.
(Cf. X. 2)

2. Records which may be kept within the department for help in classifying.

For example: Records of debatable and unsatisfactory placement of books, tentative decisions for placing subjects, final decisions awaiting more material.

3. Analyze, criticize, and re-evaluate Sayers Canons of Classification. Cf. Burgess, *Canons of Classification: a Re-Valuation*.
4. Does the content make-up of books, as written and printed, usually conform to any outline of knowledge? Discuss the physical and other elements which affect the placing of books.
5. What, in general, is the practice of libraries in adopting the new and extensive expansions of the Decimal Classification? Is the expense of total or even partial re-classification justified through an improved use of the books on the shelves?
6. Discuss the drawbacks of long class-numbers.
7. Discuss the professional as well as the extra-professional training required for classifying books in specialized fields of subject-matter.

ADDITIONAL PROBLEMS

ADDITIONAL PROBLEMS

GROUP IV

Studies in Building Systems of Classification

1. Study the various large fields of subject-matter to determine preferable bases for classification. To what fields can the principles of homology, of dichotomy, of subordination, be applied? Compare the biological sciences with other sciences, and with the arts and humanities, to show different types of subdivision. Cf. Wiley, *Some sidelights on classification*; Bliss, *Organization of Knowledge* (2 vols.).
2. Study the principles of procedure which will make possible, as time goes on, the adjustment of classification to the continuing development of knowledge. No matter what the system is, nor how excellently it has been drawn up, some adjustment will be continually necessary.

The principle of expansion and the occasional creation of new fields serve to an important extent, but are not sufficient, to meet all demands.

Study the "starvation" method of the Brussels system.

The Dewey system has considered it unwise to change or do away with its old basic divisions of subjects, on the ground of inconveniencing the libraries which have adopted the system. What are the weaknesses of such a practice?

Cf. Schofield, *The Future of Dewey* and *The Revision of Dewey*; Lancaster Jones, *Revision of the Decimal Classification*.

3. Study the nature of close classification as applied to books; that is, the practicability of minute subdivision of fields of subject-matter based upon contemporary cross-sections of knowledge, especially in the light of building for the future.
4. What is meant by a one-dimensional system of classification? By a two- or three-dimensional system? What is meant by a single linear system?
5. Draw up a classification scheme in a definite field. Then turn the job over to several specialists in the field. From their divergent outlines draw up a final outline which meets as many of the expressed requirements as possible. Show to what extent a single linear scheme fails to provide for many relationships, and to what extent the subject-catalog can take care of these.
6. How many kinds of classification schemes is it possible to devise? As many kinds as there are criteria of similarity in books. Explain.

7. Study the relation between systems of knowledge and the classification of books. How does Bliss distinguish between a philosophical and a scientific system? Cf. Bliss, Sayers, Martel, and others.
8. Compare the methods by which the Decimal Classification and the Library of Congress usually draw up an outline of classification for any field. To what extent is it true that the former produces a minute analysis of the field, while the latter attempts to adapt divisions to a large number of books actually in hand. Cf. Martel in *Report Librarian of Congress*, 1911.
9. Dr. Pierce Butler has said: "In practice, subject classification too often establishes only a point on the outmost periphery. It thus delivers to those who use it either an exhaustive specialized treatise which they cannot read or an immature dissertation which they should not." Explain.
10. Study Bliss's basic divisions of knowledge and compare with the Decimal Classification and Library of Congress systems.

The statement has been made that no library for long retains the logical order of the ten main divisions of the Decimal system, but arranges the groups with respect to each other in the library, according to convenience, necessities of space, or use. If this is true, why stress the order or sequence of major subject divisions in a scheme?
11. The process of subdivision, by successive divisions of subject-matter, separates at each step parts from the whole, thus tending, in considerable measure, to defeat its purpose of grouping like material together. Explain.
12. Compare various orders of arrangement, in addition to the systematic subject arrangement, such as the chronological, the alphabetical by author or subject, and so forth. Discuss permanency of each.
13. Notation of various outlines of classification: compare figures alone with letters alone; study combinations of both to determine ease of remembering such symbols, and their effectiveness in other ways. Might one possible way of finding out the superiority of different kinds of notation for class symbols be through the photography of the eye movements? Professor Buswell has said that photography can be used to determine the ease of remembering shorthand and other signs.

ADDITIONAL PROBLEMS

ADDITIONAL PROBLEMS

GROUP V

The Decimal and the Brussels Classifications

1. What has been the influence of the Decimal Classification on library thought and on the estimation in which library service is held? One writer has said: "One of the prime causes of the great progress made in library science during the last generation" is the Decimal Classification. Comment.
2. Would libraries using the Decimal system be averse, as has been assumed, to basic changes in this system? This question is important in view of the future effects of continuing to build on the obsolete divisions of sixty years ago, and of arranging the books accordingly.

It has been stated over and over again that some 14,000 libraries in the United States use the Decimal Classification. Specific information from these libraries might yield unexpected information as to number, nature, and extent of the modifications which they themselves have made in the system. Perhaps few ever make use of more than one or two numbers after the decimal point.

Bringing the actual practices of the users of the system together with the assumptions as to theoretical usefulness, would be very salutary.

Stress the idea: Build for the future!

3. Compare the kind of use made of the Dewey Decimal system with that made of the Brussels system. Dr. Bradford, for example, says that the latter has nothing to do with the arrangement of books on the shelves. Cf. Writings by Bradford, Pollard and others.
4. Test the value of certain of the subdivisions of the Decimal Classification in some class, by calculating how many times, if any, they have been used in large libraries, over a period of years. This has been done in one large library in the field of Astronomy. Cf. Investigation referred to on page 39 of present volume.

ADDITIONAL PROBLEMS

GROUP VI

The Library of Congress System of Classification

1. What has been the influence of the Library of Congress system of classification on library thought?
2. Study the history of the Library of Congress system, noting the influence of Cutter and Hartwig. Cf. writings of J. C. M. Hanson.
3. Study the principles of expansion of this system. Note the extent of its departure from the principles of subordination in the development of its tables; for example, its use of an alphabetical arrangement of subjects in continuation of a logical one, where, for some reason, the logical order is not apparent or not considered useful. Find examples of this in HD, HF, LD, LE, LF, LG, Q.
4. Compare the Library of Congress system with the Decimal system, noting especially the use of country numbers. For example, Library of Congress gives up the mnemonic country-numbers of the Decimal system, tending to divide not only general but also special subjects by country, while the Decimal system tends more frequently to collect material on special subjects together, regardless of country.

ADDITIONAL PROBLEMS

ADDITIONAL PROBLEMS

GROUP VII

The Dictionary Catalog: The Arrangement and Use of the Sections Devoted to Subjects

1. Examine the nature of the dictionary catalog. Discuss Cutter's assumption that the dictionary catalog is suitable for the person who wants a definite bit of information but is neither pursuing a general investigation nor trying to exhaust a subject. Consult, for example, Hanson in the *A.L.A. Bulletin*, 1909, regarding the possibilities of retaining through skilful arrangement of cards some advantageous features of a classified arrangement, thus tending to adapt the catalog to the need of the scholar.
2. Study the use that is usually made of the subject sections of the dictionary catalog. Dr. Akers has made one study of the reader's understanding and use of the bibliographical abbreviations on catalog-cards. Devise questions relating to subject-headings and cross-references to find out to what extent the patrons of the library use these and understand their underlying principles.
3. What items does the serious reader want to find on the catalog-cards when seeking material on special subjects? Analyze the act of search when seeking material on a definite topic and determine the factors which bear upon and help to define the search.

For example, the searcher is guided by many facts, as:

- a. That certain authors have written or are likely to have written on this subject, though others may also have done so.
- b. That certain countries figure largely in its development.
- c. That language is an important factor.
- d. That date of publication is important.
- e. That number of pages is important.
- f. That illustrations are important, especially for certain topics.
- g. That descriptive notes defining treatment of subject are desirable.
- h. That if the specific subject is not found he may be led by cross-references to some related topic which will include his topic.

4. What are the details which have usually been put on catalog cards which have "seemed pedantry and have excited the cheap wit of the captious critic" (Bishop)?
5. Study the arrangement of subject-cards in a dictionary catalog. There are now at least five codes for arrangement of cards, each differing in certain respects from the others. A recent idea, which is being followed by a number of libraries, is to arrange the cards word-by-word, regardless of the meaning of the heading; this mixes the form divisions, title entries, geographical divisions, all together, often separating material on the same subject.

Examples:

Jade	Etching	Geology—Ohio
The jade idol	Etching figures	Geology—Periodicals
Jade—South Africa	Etching—France	Geology—Wyoming

A corps of 12 students untrained in library method, and 12 with training, could look up the answers to a list of questions and record each single step taken to find an entry. Do this in the word-by-word arrangement, also in other more systematized arrangements.

Mr. Martel points out that a straight word-by-word arrangement "reduces the usefulness of the catalog to the habitual user and to the librarian" and only by chance helps the casual user.

6. Study the practical ways of reducing the bulk of dictionary catalogs in large libraries. Can the number of entries be reduced without reducing the completeness and efficiency of the catalog? Are printed catalogs feasible? Can bulk be reduced by building up the shelf-list and referring to certain numbers from the Public Catalog? Or by the use of more cross-references in place of duplication of subject-entries?

See H. B. Van Hoesen, ed. *Selective cataloging*.

ADDITIONAL PROBLEMS

ADDITIONAL PROBLEMS

GROUP VIII

The Classified Catalog and Shelf-List

1. Study the classified catalog: its principles and use.
2. Examine the different types of subject-indexes used in conjunction with the classified catalog. For example, those of the John Crerar Library, the Engineering Societies Library, and the Carnegie Library in Pittsburgh.
3. Explain how the entries in the classified catalog can express very minute aspects of subject-matter, and how, at the same time, the books themselves can be somewhat more broadly classed.
4. Compare the dictionary and the classified catalogs, explaining the methods by which each, in the end, can be made to produce the same information.
5. Examine the possibility and the practicability of enlarging and adapting the shelf-list to perform the service of a classified catalog. (Cf. VII, 6).
6. Compare a number of subject-indexes which are built, in general, on the principles of a systematized arrangement of subjects; for example, the *Psychological Index*, *Social Science Abstracts*, and others. Compare their alphabetical indexes.

ADDITIONAL PROBLEMS

ADDITIONAL PROBLEMS

GROUP IX

Administrative Problems, Including Cost of Cataloging and Classification

1. Administrative problems within the cataloging department. For example, Shall the classification of books and the assignment of subject-headings be carried on by the same person or persons?
2. Exchange of service between classifiers and catalogers and reference assistants. (Cf. X, 4).
3. Departmental catalogs in college and reference libraries. For example, see Raney on subject headings in *Report of the University Libraries*, University of Chicago, 1931.
4. Cost of cataloging and classification. Studies on this subject up to the present time have not produced practical results. This seems to be due to the many variable factors connected with the work, as carried on in individual libraries. Might it not be possible to apply statistical methods of research to the problem, tending thus to reduce the variable factors?
5. Economies in cataloging, including cooperative cataloging. All catalogers express the conviction that appreciable economies in cataloging and classification will come about through cooperative cataloging. Study work of present A.L.A. Committee on Co-operative Cataloging; see also Hanson on *Sound and Unsound Economy in Cataloging*.

ADDITIONAL PROBLEMS

ADDITIONAL PROBLEMS

GROUP X

Reference Work in Relation to Classification and Subject-Cataloging

1. Where does the legitimate province of library service by means of classification and subject-cataloging end, and where does bibliographical research which depends upon other tools begin? Study the possible extension of service through the former procedures.
2. Analyze the act of searching for a subject which is not represented by the actual term in the catalog, as done by:
 - a. The librarian or library reader with no special knowledge in the field.
 - b. One with special knowledge.

Choose a number of more or less abstruse but definite topics in which readers are likely to be interested and about which they are likely to be seeking information. Compare the two approaches a and b with special attention to the factors which determine and limit the act of search. Analyze steps taken.

Cf. New York Regional Catalogue Group, *The Use of the Card Catalog*.

Comment on Pellett's statement: "Experts in the use of print are amazed at the waste, often going on continually under the executive's nose, through the perpetration of rule of thumb methods. . . . It is not uncommon to see an untrained employee spend whole days in search for information that a skilful special librarian could produce within a fraction of that time."

3. Compare the work of the classifier and of the reference librarian as to differences and likenesses in method of approach.

For instance, could the former be said to consider the subject-matter of a book somewhat in the way of a textbook writer, summing-up its different aspects and recording these in accordance with a technique; while the latter considers the subject-matter but acts more as a teacher in interpreting the decisions of the classifier to the reader?

Considering the two kinds of work in another way, both classifier and reference librarian can be said to follow the same method. The former, considering the subject of a book, thinks first of the field of which the subject is a part and then determines its place in relation to other subjects within the broader

field. So also, the latter, in being asked a question, quickly thinks of the larger field and then relates the subject-matter in hand to other subjects according to the pattern of the field which he holds in mind.

The effectiveness and accuracy of such an approach depends, of course, in both cases, upon the knowledge of subject-matter possessed by the librarians. (Cf. XIII, 1)

4. Exchange of service between reference assistants and catalogers and classifiers. Cutter first talked about this at the St. Louis Conference in 1886-87. Cf. The Queens Borough Public Library, *Experience program*.

ADDITIONAL PROBLEMS

GROUP XI

Special Libraries

1. The sociological origins of special libraries.
2. To what extent can the Decimal system be used for special libraries or for very special collections of books? The editors of the Decimal Classification have assumed that the detailed expansions which they are making are suitable for collections on special subjects. Mr. Burgess has said that every general classification is composed of special classifications. To what extent is this true? Is it not true, rather, that any satisfactory special classification must provide not only for the special subject itself, but even to a greater extent, must draw into close relationship with the subject all border-line or marginal subjects, as well as fields which contribute to the special one?
3. Investigate the suitability of the Library of Congress system for special libraries. For example, The Morgan Library in New York City could not use the Fine Arts scheme, but plans to draw up one of its own. Also, Harvard for Landscape architecture added letters to NA, as NAB, NAC, etc.

Could either the Library of Congress or the Decimal Classification serve the purposes of one who wished a detailed system for a working library on the subject of "butter and eggs"?

4. Find out to what extent and with what satisfaction the various expansions of both the Library of Congress and the Decimal Classification have been actually adopted by special libraries.
5. Detailed classification in relation to special libraries. In general, have special libraries made use of minutely subdivided outlines for the arrangement of material, or have they preferred an alphabetical arrangement of material?
6. Methods of building special classifications. Investigate, for example, Harvard University on Business, Glidden on Political science, Boggs and Lewis on Maps, Yale University on Forestry, and others.
7. How bring information to the man who needs it, is the keynote of the special librarian. That is to say, how bring to light the pertinent aspects of books and other forms of printed material which will be of help to the investigator with special and strictly current interests?

Study the ways of extending the present use of subject-headings. To what extent can the catalog bring out special information? Seek the book's special value. General headings even for general books may not be as helpful as the bringing out of some point of view or phase of a subject not found elsewhere.

ADDITIONAL PROBLEMS

GROUP XII

Proposed Training for Librarians in Fields of Subject-Matter

1. Courses of study covering special fields of subject-matter are needed to prepare one to meet the requirements of library service. This is important for many reasons:
 - a. Adult education with its need of specialized information.
 - b. Growth of specialized reference libraries which are devoted to the building-up of definite fields of subject-matter.
 - c. Special collections and the departmental division of subject-matter in universities and colleges and in large public libraries.
 - d. Growth of business and many other forms of special libraries.
 - e. General increase in demand from all types of serious readers for special service from public libraries.
2. Consider the following subjects and types of courses as of particular use in preparation for librarianship, the object being to qualify prospective students for understanding the fields of subject-matter with which they will have to deal:
 - a. Survey courses of the following kinds:
 - (1) General courses for beginners in history, political science, economics, science, technology, psychology, education, etc. The student should choose from among these his desired specialty, basing the courses under the following paragraph on these introductory courses.
 - (2) Advanced survey courses which deal with the history of the development of thought and theories in specified fields of subject-matter. Such courses open up the literature and biography of a subject, sometimes give a certain insight into research methods, and afford a summing-up and a comparative epitomization of parts within a wider field; they thus afford an organized view of a field showing the interrelations of the smaller fields which comprise the larger one.

N.B. This type of course should be preceded by 2. b. below.

(3) Courses in histories of thought and of the trends and tendencies of culture and scholarship. This type of course and the preceding one (2) tend to emphasize relationships of theories and facts and to trace their influence within the field and on thought in general.

(4) Courses which stress and clarify terminology through a conceptual approach to a subject.

b. Specialization in some rather broad field, as Sociology, Psychology, Biology, etc. Besides the special subject knowledge thus afforded, such courses would tend to disclose the importance of similar study in other fields.

NB. This should precede 2. a. (2) above.

c. Courses dealing with bibliographical methods, historical method, and methods of research.

d. Languages: French, German, Spanish, Latin and Greek. (It may be that the importance of foreign languages for average public library work has been over-stressed, since many librarians almost never handle books in other than the English language).

GROUP XIII

Techniques Needed for the Integration of the Subject-Matter in Books With the Practical Requirements of Library Service

1. Studies can be made in different fields of subject-matter for the purpose of determining ways in which these can be analyzed and outlined and put into helpful form for the librarian.

Different techniques can be devised for the "Integration of the subject-matter in books with the practical requirements of library service" and this may well constitute one of the most important and valid objectives for library research.

An analysis of any field of subject-matter, together with a graphic representation of its structure, showing relationships of subjects within the larger field, is an excellent training for one who, later, will be called upon to classify books, determine subject-headings, or find information for library patrons. (See X, 3) Such analyses may be in the form of a systematically subdivided outline; or in other graphic form.

An example of such representation is to be found in a chart relating to the field of Psychology, made by the present writer described in the article entitled *The Subject Approach to Books*.

INDEX

*References to the Problems contained in the Appendix
are indicated by (App.) before the page-numbers.*

- Abbreviations on catalog cards, study of, (App.) 173
- Access-to-shelves, 107
 - limited in European libraries, 45
- Accession order conveys no subject-meaning, 70
- Administrative problems in catalog department, (App.) 179
- Adult education
 - and related topics, 18
 - its need of specialized information, (App.) 185
- Agriculture, special classification for, 43
- Akers, S. G. (App.) 173
- Allen, J. A. *American Bisons*, 98
- American Bison Society, *Reports*, 98
- American Dream
 - automatic recording of subject-matter, 5
 - unfulfilled, 6
- American Library Association, Cooperative Cataloging Committee, (App.) 179
- Americanization (subject-heading), 109-10
- Analytical entries, 65, 107, 111, 123
- Andrews, C. W. quoted, 60
- Arrangement of cards, codes in use, (App.) 174
- Arrangements of books
 - are they endorsed by readers? 6
 - assumed of equal help to all, 16
 - crying need for improvement, 29
 - elements affecting usefulness, 19, 66-82, summarized, 81-2
 - extensive, complex, and chaotic, 6
 - for use by public, 6
 - in European libraries, 43
 - insufficiencies and frustrations, 7, 80
 - judged by future readers, 6
 - not a function of Brussels Classification, 41
 - not flexible, 20
 - not obvious to reader, 17
 - paralleled subject-cards, 34
 - permanency of various types of, (App.) 166
 - simpler orders rarely favored, 62
 - specific subjects located, 72
 - starting-point in finding material, 18
 - static evidence of efforts to classify, 6
 - tracing reasons for, 15
 - ultimate value of classification, 21
 - use affected by removal of books, 80, 107
 - use by reader, due to classification, 21
 - use of, merest starting-point, 99
 - usefulness, 27
- Association des bibliothécaires français, *Règles générales proposées pour la rédaction des catalogues*, 45
- Assumptions regarding classification, 59-63
 - a priori*, 15
 - detailed classification of equal help to all, 16
 - large collections require minute classification, 16, 21
 - major resources indicated, 61
 - may be unconsciously held, 60
 - need examination, 60
 - no special knowledge needed to classify, 63
 - one arrangement of equal help to all, 62
 - out-of-date systematic order preferred to simpler arrangement, 61-2
 - require measurement, 22
 - shelves and catalog reveal resources on subject, 63
- Astronomy tables, in John Crerar Library, 39
- Author-catalogs, 47

- Beaver (subject-heading), 83, 97-8
 distribution of material in percentages, 90, (table) 91
 position in classification systems, (table) 84-5
 steps tracing material on, (table) 88-9
- Bibliographical research, 86, 128, (App.) 181, 186
 danger of substituting classification for, 24
 yields greater proportion of material, 26
- Bibliographies, subject
 analyzed, (App.) 155
 rarely up-to-date, 48
- Bibliothèque nationale, 44
 author-catalog, 47
- Biological sciences, type of subdivision, (App.) 165
- Bishop, W. W. (App.) 174
- Bliss, H. E. 9, (App.) 165, 166
 cited, 20, 56
 quoted, 25, 30
 quoted by L. A. Burgess, 57
The Organization of Knowledge and the System of the Sciences, 33
The Organization of Knowledge in Libraries, 33
A System of Bibliographic Classification, 33
- Bliss, Richard, quoted, 25
- Boggs, S. W. and Lewis, D. C. (App.) 159, 183
- Books, arrangements of. *See* Arrangements of books
- Books, collections of
 classification applied to, 6
 detailed classification for large, 16
 representations in print of world's knowledge, 5
 uniform accretions assumed, 21
- Books, content of
 and topical analyses of fields, 39
 composite, 100
 does not conform to outline, 72
 make-up, (App.) 163
- Books, disorder of, due to open shelves, 80
- Books, withdrawal from shelves, 80
- Boston Athenaeum, 31
- Boysen, Karl, (App.) 156
- Bradford, S. C. (App.) 169
 quoted, 41
- British Museum, author-catalog, 47
- Broad classification, 19, 27, (App.) 169
- Brussels Classification, 40-3
 for card-indexing of journals, 40
 key to scientific literature, 41
 not for arrangement of books, 41
 relation to Decimal Classification, 40
 "starvation" method, (App.) 165
- Buffalo, American (subject-heading) 83, 97-8
 distribution of material in percentages, 93, (table) 94-5
 position in classification systems, (table) 84-5
 steps tracing material on, (table) 92-3
- "Build for the future," (App.) 165, 169
- Burgess, L. A. (App.) 183
Canons of Classification; a Re-Valuation, 57, (App.) 163
- Bushnell, G. H. quoted, 32
- Business, building classification in, (App.) 183
- Buswell, G. T. (App.) 166
- Butler, Pierce, quoted, (App.) 166
- "Butter and eggs," working library on, (App.) 183
- Canons of Classification.* *See* Sayers, W. C. B.
- Captions in classification, and subject-headings, (App.) 156
- Catalog, classified. *See* Classified catalog
- Catalog department, administrative problems in, (App.) 179
- Cataloging, determine cost through statistical methods, (App.) 179
- Cataloging, cooperative, (App.) 179
- Catalogue méthodique. *See* Classified catalog
- Catholic books, classification for, 67
- Change. *See* Social change
- Chicago, University of
 Graduate Library School, 9
 Library, (tables) 88-9, 92-3, 112-14, 123
Report of the University Libraries, (App.) 179

- Circulation of books, ignored in calculations, 107
- Classification, history of, 23-46
 discussion preceding adoption of systems valuable, 24
 early arguments died away, 29
 early discussion product of period, 23
 early disputants lacked experience, 23
 finest librarians participated in discussion, 24
 practices summarized in 1893, 26
 transition period, 1876-1900, 29
- Classification, systems of,
 adjust to future, 31
 based on criteria of similarity, (App.) 165
 based on contemporary knowledge, 30
 building, (App.) 165
 built by specialists, (App.) 165
 effect of out-of-date outlines, 79
 growing knowledge and, 30, (App.) 165
 "homemade" expansions, 75, 79
 in special field, (App.) 165
 means to an end, not an end, 57
 multi-dimensional, 68, (App.) 165
 out-of-date, a disservice, 30
 rarely available at shelves, 80
 should sort definite groups of books, 127
 static in relation to knowledge, 54
 vast expansions, 54
See also Bibliographic Classification; Decimal Classification; Expansive Classification; Library of Congress Classification
- Classification décimale. *See* Brussels Classification
- Classification of books, close. *See* Close classification
- Classified catalog, (App.) 177
 alphabetical index essential, 34, 70
 catalogue méthodique, short-comings of, 44-5
 difficult to comprehend, 34
 Engineering Societies Library, 35
 a glorified shelf-list, 34
 influenced form of Decimal Classification, 34
 John Crerar Library, 35, 47
 may not reveal important works, 44
 minute entries but broadly classed books, 60, (App.) 177
 not so flexible as dictionary catalog, 45
 Pittsburgh Carnegie Library, 35
 usefulness decreases, 36
 value depends upon scheme, 35
 yields to dictionary catalog, 36
- Classifiers
 cannot always determine use of books, 58
 careful work by, 78
 continually face new situations, 76
 criticize requests for change, 63
 equipment needed by, 6, 58, 75, (App.) 163, 185, 187
 exchange of, with reference assistants, (App.) 179, 182
 force books into old places, 62
 forced to use out-moded symbols, 79
 insert specific subjects, 61
 knowledge of specific needs of readers required, 6
 knowledge of subject-matter required, 6
 preparation inadequate, 75-7
 problems presented in performance of duties, 76
 rely upon "cults," 77
 with special knowledge, (App.) 163
 without special knowledge, (App.) 163
 work compared with reference service, (App.) 181
See also Librarians
- Class-numbers
 accepted uncritically, if printed, 77
 compared with catalog, 65
 ease of remembering, (App.) 166
 lead to particular books, 38
 length, 55, 62, 81, (App.) 163
- Close classification, 28, 39, 60, 61, (App.) 165
 and relative location, 30
 definition unnecessary, 27
 for bibliographical work, 42
 for journal articles, 43
 a hindrance in growing fields, 68
 meaning, 27
 object of veneration, 25
 reasons against, 45-6

- Close classification—*Continued*
 separates parts from their wholes, 25
 versus broad, 19, 27
 warnings ignored, 31
- Collections of books. *See* Books, collections of
- Collembola (subject-heading) 110
- Concilium Bibliographicum, 86
- Consensus of knowledge, 33, 66
- Content of books. *See* Books, content of
- Coolidge, A. C. cited, 48
- Cormorant (subject-heading) 83, 93-4, 97-8
 distribution of material in percentages, (table) 97
 position in classification systems, (table) 84-5
 references divided, (table) 95
 signs devised for tabulation, 94-5
 steps tracing material on, (table) 96
- Cost of classification, can statistical methods be applied to? (App.) 179
- Country life (subject-heading) (App.) 159
- Country numbers, use by Library of Congress and Decimal systems, (App.) 171
- Courses of study
 foreign languages, (App.) 186
 general and advanced survey, (App.) 185
 history of thought, (App.) 186
 methods of research, (App.) 186
 needed to meet library requirements, (App.) 185
 specialization in broad field, (App.) 186
 terminology clarified through conceptual approach, (App.) 186
- Criteria of similarity, basis for classification, (App.) 165
- Cross-references, (App.) 159
 bind entries together, 37
- "Cults" of the classifier, 77
- Culture and scholarship, trends and tendencies, (App.) 186
- Curricula. *See* Courses of study
- Curtiss, D. W. cited, 43
- Cutter, C. A. 31, (App.) 171, 173, 182
 cited, 37
 dictionary catalog, monument to, 36
 quoted, 24
Rules for a Dictionary Catalog, 36
See also Expansive Classification
- Cutter, W. P. quoted, 36
- "Daily deepening drift of books," 49
- "Dated" scheme of classification, 32
- Daylight saving (subject-heading) 110
- Decimal Classification, 8, 28, 30, 31, 61, 102, (App.) 165, 166
 ably expanded, 8
 adoption of expansions, (App.) 163
 and special libraries, (App.) 183
 as taught, 75
 examine use by libraries, (App.) 169
 influence on library thought, (App.) 169
 insuperable obstacles in application, 8
 made originally for non-scientific books, 53
 method of expansion, 54
 modified in Norway and Denmark, 43-4
 no longer controled cards, 38
 purpose differs from Brussels Classification, 40
 rarely carried beyond first or second decimal point, 106
 relation to Brussels Classification, 40
 relation to changing conditions, 54
 tending toward extreme detail, 38
 test value of subdivisions, (App.) 169
 use compared with Brussels system, (App.) 169
 used first with classified catalog, 34
 used in England, 43
- Definite groups of books should be sorted out, 59
- Delisle, Léopold, quoted, 44
- Denmark, libraries in. *See* European libraries
- Departmental catalogs, in college and reference libraries, (App.) 179
- Departmental libraries, (App.) 185
- Detailed classification. *See* Close classification
- Devereaux, H. B. cited, 51
- Dewey, John, cited, 23

- Dewey, Melvil, 34
 cited, 30
 quoted, 60
See also Decimal Classification
- Dichotomy, (App.) 165
- Dictionary catalog, 28, (App.) 173-4
 arrangement of cards, 37
 can retain systematic features, (App.) 173
 codes for arrangement of subject-cards, (App.) 174
 compared with classified catalog, (App.) 177
 compensates for weakness of classification, 127
 distribution of titles, (App.) 155
 distribution of titles, comparison of results, in percentages, (table) 123
 distribution of titles under specific subjects, 100-29, (tables) 112-21
 expresses variety of aspects, 46
 lightens burden on classification, 38
 monument to C. A. Cutter, 36
 permits concrete indication of specific subjects, 20
 reducing bulk, (App.) 174
 skilful arrangement of cards allows survey of field, 37
 skilful arrangement of cards required, 69
 specialists seldom use subject-sections, (App.) 160
 specific subjects in, 73
 supplements classification, 36-7, 69
 supplements shelf-arrangement, 37
 traces minute topics, 59
 use by readers of subject-sections, (App.) 173
 vast dimensions of, 6
 yields information up to certain point, 128
 yields more subjects than classification, 7
- Diesch, C. H. (App.) 156
- Discipline through classification, 129
- Distribution of titles
 comparison of results, in percentages, (table) 123
 under specific subjects, 100-29, (tables) 112-21
- Donker Duyvis, F. warns against too great subdivision, 42
- Education, subject-headings in, (App.) 159
- Educational function of library, 5
- Educational progress through library service, 5
- Edwards, Thelma, quoted Dr. Guthrie, 39
- Electrical engineering, subject-headings in, (App.) 159
- Elements affecting usefulness of classification, 19, 66-82, summarized, 81-2
- Engineering sciences, theoretical treatment of, 78
- Engineering Societies Library, classified catalog, 35, (App.) 177
- England, libraries in. *See* European libraries
- Etching (subject-heading) (App.) 174
- European libraries
 access-to-shelves limited, 45
 close classification for books not favored, 43
 Decimal Classification modified in Norway and Denmark, 43-4
 Decimal Classification used in England, 43
 fixed location in, 46
 reasons against detailed classification for books, 45-6
 subject-approach to books, (App.) 156
- Evolution of subject-headings, (App.) 159
- Exegetical discussion, related to classification, 15
- Expansions, homemade, 79
- Expansive Classification, 31
- Factors affecting classification. *See* Elements affecting usefulness of classification
- Fellows, Dorkas, justifies use of detail, 39
- Fenton, Polly, (App.) 159
- Financial subjects, subject-headings in, (App.) 159
- Fixed location, 29
 continuance not justified, 46

- Fletcher, W. I. quoted, 24-5
 Fool-proof index, essential to classified catalog, 34
 Ford, G. S. quoted, 17
 Forestry, building classification in, (App.) 183
 Foster, W. E. cited, 58
 Frauendorfer, Sigmund von, cited, 41, 43
 Frequency of citation of subjects, (tables) 112-21
 Frustrations met in using books on shelves, 7, 17, 80
 General information cards reduce number of subject-entries, (App.) 159
 Geology (subject-heading) (App.) 174
 Giddings, F. H. quoted, 55
 Glidden, S. H. (App.) 183
 Gross relationships for debatable subjects, 59
 Group discussion (subject-heading) 18
 Guthrie, Dr., comments on Psychology expansion, 39
 Hagbert-Wright, C. T. H. quoted, 49
 Halle *Schema*, 70
 Hanauer, Julius, (App.) 156
 Hanson, J. C. M. (App.) 171, 173, 179 cited, 37
 quoted, 32, 41-2
 Hartwig, Otto, (App.) 171
 Harvard University, (App.) 183
 Historical method, (App.) 186
 History
 based on unique facts, 67
 divided by order of events, 71
 "Homemade" expansions, 75, 79
 Homogeneous groups of readers and special libraries, 51
 Homology, (App.) 165
 Hornaday, W. T. *Extirpation of the Buffalo*, 98
 How classification works, 7, 64, 83-99
 Ideas, Relationship of, 128
 Ideas comprise knowledge in patterned unity, 129
 Ideas in books, librarian's responsibility in bringing readers in contact with, 5, 128-9
 Illiteracy (subject-heading) 109
 Imposed factors affecting classification, 19, 74-81, 126
 Index, alphabetical, to classified catalog, 34
 Index, relative. *See* Relative index
 Indexing
 the classified catalog, (App.) 177
 compared with classification, 39, 43
 compared with subject-headings, (App.) 159
 subject-indexes compared, (App.) 177
 Industrial relations, subject-headings in, (App.) 159
 Information
 keynote of special library, (App.) 183
 sought by untrained employee, (App.) 181
 Inherent factors affecting classification, 19, 66-74, 126
 Institut international de coopération intellectuelle. *See* International Committee on Intellectual Cooperation
 Institut international de documentation (Institut de bibliographie) Classification décimale. *See* Brussels Classification
 Insurance, subject-headings in, (App.) 159
 Integration of subject-matter with library service, (App.) 187
 Interest, fields of
 determine pattern of classification, 71
 of readers, 51, 58
 International Committee on Intellectual Cooperation, 42, 43
 International Institute of Agriculture in Rome, 41
 special classification system, 43
 Investigation number 1
 how systematic classification works, 26, 64, 83-99
 Investigation number 2
 distribution of titles in dictionary catalog, 28, 65, 73, 100-29
 procedure, 105-11
 Jade (subject-heading) (App.) 174
 John Crerar Library, (App.) 177
 astronomy tables, 39
 classified catalog, 35, 47, 60

- Journal articles, more unitary than composite, 43
- Kelley, G. O. (App.) 159, 187
 cited, 40, 51
 experience in classification, 17-18
 quoted, 49, 55
- Kelley, T. L. 9
- Keogh, Andrew, quoted, 60
- Kephart, Horace
 cited, 60
 quoted, 26-7
- Knowledge
 and classification, 129, (App.) 166
 authoritarian, in religion, 66
 classification and developing, 54
 comprised of ideas arranged in patterned unity, 129
 consensus of, 33, 66
 contemporary cross-section of, 30, 35, (App.) 165
 continuous growth of, 129
 dead if stored in unused books, 5
 fields change in content and meaning, 62
 interrelations of fields, (App.) 185
 major divisions comparatively stable, 66
 need for an understanding of growing, 128
 order of main divisions of, (App.) 166
 organization not static, 66
 organization of, 33, 128
 represented in books, 5
 symbolized by unity, if static, 54
- Knowledge, specialized, needed by classifiers, 58, 63
- Ladewig, Paul, (App.) 156
- "Lag" between theory and practice, 76
- Lancaster Jones, E. (App.) 165
- Languages, foreign, courses of study, (App.) 186
- Lewis, H. F. *Natural History of the Double Breasted Cormorant*, 94
- Leyh, Georg, (App.) 156
- Librarians
 training in subject-matter, (App.) 185, 187
 turning toward administrative interests, (App.) 153
See also Classifiers
- Librarianship and library service
 activities socially valuable, 128
 bringing the right books to right readers, 5
 classification affords discipline for, 129
 conditions changing in field of, 5
 early literature rich in discussion of classification, 23
 educational function, 5
 educational progress and, 5
 enhanced through availability of subject-matter, 48, 129
 integration of subject-matter with service requirements, (App.) 187
 training in subject-matter needed to improve, (App.) 185
 transition period 1876-1900, 29
- Libraries
 require different kinds of classification, 49
 transition from general to special, 51
 undertake re-classification rarely, 74
See also Public libraries; Special libraries; Specialized and reference libraries; University and college libraries
- Libraries in Europe. *See* European libraries
- Library of Congress, (tables) 115-17, 123
 analytical work, 26
- Library of Congress Classification, 8, 28, 31-2, 102, (App.) 166, 171, 183
 country numbers, (App.) 171
 few modifications made, 106
 for national library, 32
 in Vatican Library, 43
 principles of expansion, (App.) 171
 provisional draft modified through application, 32
 uses alphabetical order, 70
- Library schools
 examination in classification, 75
 special subject knowledge not required by, 63

- Library service. *See* Librarianship and library service
- Library technique
must permit accurate decisions, 6
standardized, 29
- Lighting in the stacks, inadequate, 80
- Linear order, (App.) 165
- not adequate to represent books, 68
- Literature, divided by form or period, 71
- Living minds produce new knowledge, 5
- The London Library, 49
- Louis, Saint, Reign of, 44
- Lynn, J. M. *An Alternative Classification for Catholic Books*, 67
- Mann, Margaret, quoted, 35
- Maps
building classification for, (App.) 183
subject-headings in, (App.) 159
- Marginal fields contribute to special field, (App.) 183
- "Marginal fields of research," 55
- Martel, Charles, 9, (App.) 166, 174
cited, 23
quoted, 32
- Massachusetts State Library, (tables) 118-19, 123
- Mathematics, alphabetical arrangement, 31
- Maynard, Katherine, (App.) 159
- Meaning of class-symbols, 38
- Merrill, W. S. *Code for Classifiers*, 57
- Morgan Library, (App.) 183
- Morley, L. H. (App.) 159
- Movable location, 29-30
- Multi-dimensional arrangements, (App.) 165
impractical, 68
- New York Regional Catalogue Group, *The Use of the Card Catalog*, (App.) 181
- Nichols, Ruth, (App.) 159
- Northwestern University Library, (tables) 120-1, 123
- Norway, libraries in. *See* European libraries
- Notation, kinds of, (App.) 166
- Objective examination of classification, 6
- Orders of division
by author, time, form, or place, 70
logical, not readily understood, 70
use kinds easily understood, 71
- Organization of knowledge. *See* Knowledge, organization of
- Pacific Northwest Library Association, cited, 39
- Pamphlets call for long class-numbers, 80
- Papal Commission for the Classification of Canon Law, 67
- Patents, decimal symbols applied to, 44
- Patterned unity of ideas, capable of varying designs, 128
- Peddie, R. A. quoted, 47
- Pellett, M. E. (App.) 181
- Period classification merits study, 75
- Perkins, F. B. and Schwartz, J. quoted, 25, 27
- Pettee, Julia, (App.) 159
- Philosophy, divided by nationality, 71
- Physics, Modern, difficult to classify, 30
- Pittsburgh. Carnegie Library, Technology Department, (App.) 177
classified catalog, 35
- Political science, building classification in, (App.) 183
- Pollard, A. F. C. (App.) 169
cited, 41
- Poole's Index, 86
- Pragmatic test of classification, 21
- Preussische Staatsbibliothek, Gesamtkatalog, 47
- Printed material, increase in output of, 31
- Problems in classification, (App.) 151-87
- Professions, educational requirements in, 50
- Professors. *See* Students and professors
- Psychological Index*, (App.) 177
- Psychology, decimal expansion, 39, 80, 83
- Public libraries, foreign languages overstressed, (App.) 186

- Public libraries, large
 - few classify in strict accordance with system, 28
 - reference collections, 50
 - specialize in particular fields, 49
- Public libraries, small, 49
- Purpose of books. *See* Use made of books
- Putnam, Herbert, quoted, 32
- Queens Borough Public Library, *Experience Program*, (App.) 182
- Raney, M. L. (App.) 179
- Ratio Studiorum*, 67
- Readers
 - are arrangements endorsed by? 6
 - at sea before books, 25
 - blame whole library system, 17
 - bringing the right books to right, 5, 128
 - brought into contact with ideas in books, 128
 - detect large divisions only, 17
 - directed to definite subject, 72
 - disappointments and frustrations of, 17
 - homogeneous groups of, 51
 - led from one subject to most closely related, 17
 - librarian's policy unfamiliar to, 101
 - need instruction in use of catalog, 63
 - needs met but partially through classification, 127
 - not accustomed to expert help, 48
 - one common order of unequal help to, 16
 - psychological needs served, 128
 - relation between library and, 6
 - same arrangement of books equally helpful to all (assumption), 62
 - seek particular books, 38
 - service to, rendered through classification, 7
 - specific needs of individual, 6
 - study criticisms of, (App.) 155
 - technique of classification not understood by, 100
 - unaware of order of books before them, 17
 - usefulness of classification to, 52
 - vary in requirements, 58
 - viewpoint, 7, 15-22, 52
 - will depend on well-made catalog, 49
 - See also* Specialists and scholars; Students and professors
- Readers' Advisory work, assembling books according to use, 18
- Readers' Guide*, 86
- Re-classification, (App.) 163
 - reasons against, 74
- Records helpful in classifying, (App.) 163
- Reference collections in public libraries, 50
- Reference libraries. *See* Specialized and reference libraries
- Reference service, (App.) 181
 - compared with work of classifier, (App.) 181
 - exchange of assistants with classifiers, (App.) 182
- Re-interpretation of old decimal places, 55
- Relationships between subjects, 58, (App.) 185-7
 - differ for different readers, 72
 - distorted and inadequate, 55
 - multitudinous, in minds of readers, 17
 - utilization through classification, 128
- Relative index to Decimal Classification, inadequate, 34
- Relative position of subjects, 29-30
- Relief maps (subject-heading), 109-10
- Religion, authoritarian and traditional, 66
- Representations in print, collections of books, 5
- Research methods, (App.) 186
 - devising techniques for integration of subject-matter, (App.) 187
 - insight into, (App.) 185
- Resources of library, not brought together, 24
- Richardson, E. C.
 - cited, 56
 - quoted, 58
- Rome. Institute of Agriculture. *See* International Institute of Agriculture in Rome
- Rules for classifying, 56-8
 - not understood by reader, 101

- Rural sociology (subject-heading), (App.) 159
- St. Louis Conference, 1886-87, (App.) 182
- Sayers, W. C. B. (App.) 166
Canons of Classification, 56, (App.) 163
Canons of Classification; a Re-Evaluation, by L. A. Burgess, 57
- Schofield, E. B. (App.) 165
 quoted, 56
- Scholars. *See* Specialists and scholars
- Sciences, interrelated and welded together, 55
- Scientific literature
 adapted for systematic arrangement, 35
 and Brussels Classification, 41
 in periodicals, 26, 73
- Scudder, S. H.
 quoted, 26
- "Scylla and Charybdis" of classification, 79
- Sealock, R. C. cited, 51
- Search, act of
 by librarian with and one without special knowledge, (App.) 181
 by untrained employee, (App.) 181
 in seeking material in dictionary catalog, (App.) 173
- Selection of books
 by public librarian, 51
 for specialized libraries, 51-2
 in various kinds of libraries, 49-51
 transition from general to special library, 51
- Selective Cataloging*, (App.) 174
- Separation of parts from whole, 25
- Shelf-arrangements. *See* Arrangements of books
- Shelf-list
 and classified catalog, 34, (App.) 177
 relation to order of books, 21
- Shelf-markings inadequate, 80
- Shunke, Ilse, (App.) 156
- Simplification of classification called for, 127
- Social change, inevitable, 68
- Social investigation affects classification, 67
- Social Science Abstracts*, (App.) 177
- Social sciences, original investigation, 26
- Social situation, everchanging, 68
- Socially valuable service, 128
- Sociology
 conceptual approach, 71-2
 historical approach, 72
 statistical approach, 71
 subject-headings in, (App.) 159
- Sorting-out of clearly related groups of subjects, 59
- Special libraries, (App.) 185
 and Decimal Classification, (App.) 183
 important position in library world, 50
 information, keynote of, (App.) 183
 sociological origins, (App.) 183
 systematic or alphabetical arrangement, (App.) 183
- Specialists and scholars
 items on catalog cards needed by, (App.) 173
 keep track of literature, 48
 need aid of well-made catalog, 49
 need special information, (App.) 183
 not satisfied with classification, 48
 reasons for not using subject-catalog, (App.) 160
 see field according to interests, 71
- Specialization, age of
 and classification of books, 31, 38
 increase of printed material, 31
- Specialization in broad field, (App.) 186
- Specialized and reference libraries, selection of books, 50, 52, (App.) 185
- Specific subject-headings. *See* Subject-headings, specific
- Speculation (subject-heading) 109-10
- Sponges (subject-heading) 110
- Standardization of library technique, 29
- "Starvation" method of Brussels system, (App.) 165
- Statistical methods, applied to cost of cataloging, (App.) 179
- Stephen, Sir Leslie, quoted, 48
- Students and professors
 handicapped by arrangements of books, 80
 served by dictionary catalog, 37

- Students, library, consider classification standardized, 75
- Subdivision of subjects
 based upon contemporary knowledge, 30
 impractical if too detailed, 20
 may yield decreasing aid, 69, (App.) 166
 point of convenience, 24
 practical degree of, sought in terms of results, 20
 topics merge into most closely related subjects, 16
 types of, (App.) 165
 values lost, 55
- Subject Approach to Books*, (App.) 187
- Subject-approach to books, 15, 47-65, 127
 in Europe, (App.) 156
 through classification and subject-cataloging, 53
- Subject-catalog. *See* Classified catalog, Dictionary catalog
- Subject-cataloging, (App.) 159
 cross-references relate entries, 37
 literature meager, 9
 relationship with classification, (App.) 155
 reveals more than classification, 74
 reveals subject-matter, 5
 survey of field, (App.) 153
- Subject-headings
 and captions in classification, 102, (App.) 156
 authorities for, (App.) 160
 bulkiness in number of titles, 110
 collecting separating specific, 104
 collecting specific, 104
 compared with subject-index entries, (App.) 159
 determined by one with and one without special knowledge, (App.) 159
 deriving lists of, (App.) 159
 evolution of, (App.) 159
 extend present use of, (App.) 183
 frequency of citation in catalog, (tables) 112-21
 general inclusive, 105
 general information cards reduce number of entries, (App.) 159
 keeping up-to-date, (App.) 160
 procedure for new, (App.) 160
 separating specific, 103
 specific, 103, 105
 specific: distribution in catalog, 124-5
 specific: one-third of material under class-number, 73, 125, 126
 specific: steps leading to material, 83
 types of, 103-5
- Subject-indexing. *See* Indexing
- Subject-matter
 affects topic distribution, 111
 American Dream, to reveal, 5
 analysis of fields, (App.) 187
 availability to readers, 48, 51
 classification and subject-cataloging reveals, 5
 classification reveals small proportion of, 7
 composite in books, 43
 contact with minds, 5
 diverse, in books, 72
 form of subdivision differs for different fields, 19-20, 67
 integration of, with requirements of library service, (App.) 187
 less subdivision for shelves, 28
 loosely related, in periodicals, 73
 need for availability, 47-65
 patterns differ, 72
 related, scattered for Advisory work, 18
 related, scattered on shelves, 7
 relative importance of various items, 97-8, 108
 scattered, 52
 sought impatiently by scholars, 48
 special knowledge needed by classifier, 63, 75
 specific indication in catalog, 20
 steps tracing, (table) 87
 training of librarians in, (App.) 185
- Subordination, (App.) 165
 factor affecting usefulness, 25-6
 separates parts from whole, 69
 under Zoology, 83
- Superordinate subject groups, (table) 84-5
- Survey courses. *See* Courses of study

- Survey of fields of classification and subject-cataloging, (App.) 153
- Systematic order of books
 carries seed of change, 66
 generally useful though with limitations, 36
 helpful for greater number of fields, 126
 not readily understood, 70
 separates parts from whole, 69
 separates sub-classes less widely than other forms, 25
 value lies in locating groups of books on concrete subjects, 72
- Terminology, courses which clarify, (App.) 186
- Theology, subject-headings in, (App.) 159
- Theology, Catholic, 67
- Thought, history of
 courses in, (App.) 186
 in specified fields, (App.) 185
- Thought and culture, carried on through contact of ideas with living minds, 128-9
- Topic distribution affected by nature of subject-matter, 111
- Topical analyses of fields compared with classification, 39
- Training for classifiers. *See* Classifiers, equipment needed by
- Training for librarians. *See* Librarians, training
- Transition period in librarianship, 29
- Tree of knowledge, 56
- United States, Bureau of Education, *Public Libraries in the U.S.*, 23
- University and college libraries, selection of books, 50
- Use made of books
 affected by removal of books from shelves, 107
 basis for studying classification, 27, (App.) 156
 both worthwhile and superficial, 108
 criterion for classification, 18, 57-8, 78
 determines value of classification, 15, 52, 61, 126
 due to classification, 7
 elements affecting, inherent and imposed, 19, 66-82, summarized, 81-2
 Readers' Adviser considers, 18
 tests value of system, 33
 unreliable at shelves, 99
- Usefulness of classification, elements affecting use, inherent and imposed, 19, 66-82, summarized, 81-2
- Utilitarian nature of classification, 15
- Variations in percentages show consistent tendency, 122-4
- Vatican library, Library of Congress system, 43
- Vocational guidance (subject-heading) 18
- Voegelin, L. B. (App.) 159
- Wiley, Edwin, (App.) 165
- Will-o'-the-Wisp, close classification, 25
- Wilson, L. R. cited, 23
- Woodside Does Read*, 51
- World's Library Congress, 60
- Yale College, *Catalogue of the Most Valuable Books in the Library of*, 47
- Yale University, (App.) 183
- Youth movement (subject-heading) 18
- Zoological Yearbook*, 87
- Zoologischer Bericht*, 86
- Zoology, subordination shown under, 83

